

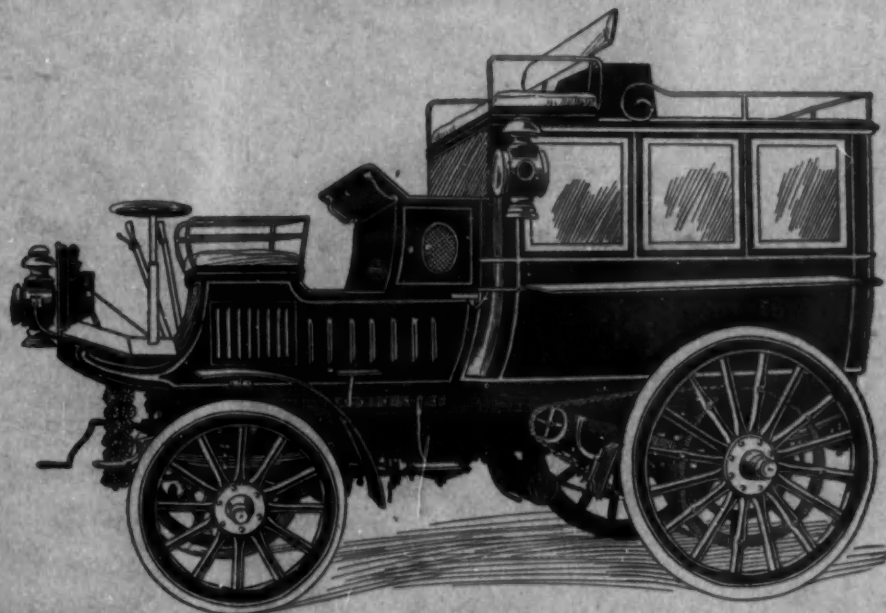
Motor Age

Vol. II. No. 9

AUGUST 28, 1902

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Motor Age

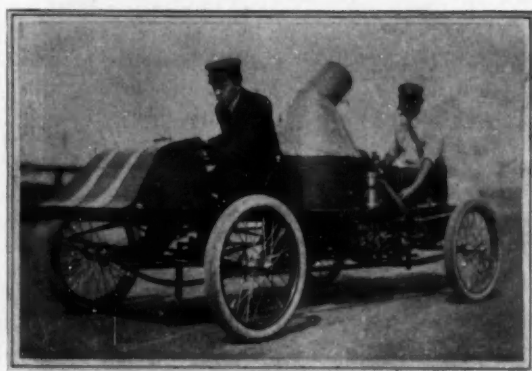
WITH WHICH IS INCORPORATED
CYCLE AGE

VOL. II. No. 9.

CHICAGO, AUGUST 28, 1902.

\$2.00 PER YEAR

RACES
AND
RECORDS



AT
LONG
ISLAND.

THE CANNON STEAM RACING MACHINE.

New York, Aug. 24.—New York had its inaugural motor vehicle race meet yesterday. It was run at the Brighton Beach mile running track. The Long Island Automobile Club, which gave America her first endurance run and her first straight-away time trials, promoted it.

An automobile meet was run on the old Guttenburg, N. J., track across the Hudson September 18, 1900. This was America's first. It was made memorable by the splendid chauffeurship of Albert C. Bostwick, who in his newly bought Rene de Knyff record holder established a set of American best figures that remained for many a day unbeaten. Bostwick's performance that day really aroused the first interest in the possibilities of racing automobiles on tracks.

As is usual with the functions of the sport promoted by this club there was much preliminary interest in the event. It bore fruit in a gathering of between 3,000 and 5,000 spectators on the stand, club house and lawn. It is hard for an outsider to guess at the size of crowds in this vast enclosure. It is certain, however, that there was enough gate money to pay the liberal prizes offered and cover the expenses.

The much advertised appearance of the Fournier and Tod Sloan Mors machines and the Baron de Rothschild Panhard was not forthcoming. The gentlemen of the

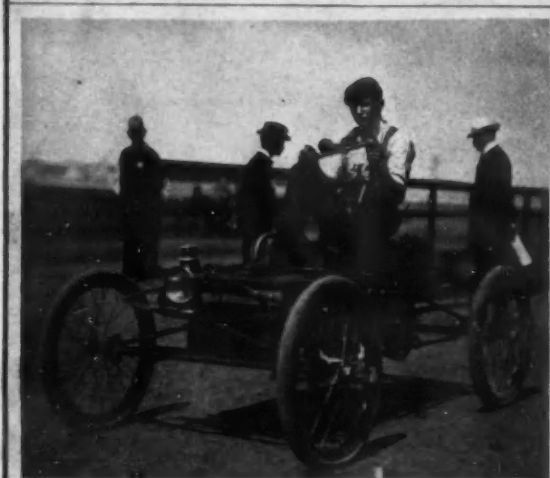
club and committee, of course, had ground for the announcement and the placing of the three famous flyers on the programme. The reason for their absence was not announced. The entry of two other racing machines presumably of attractive interest to the public was made good by their appearance. They were the George C. Cannon and the Howard Automobile Co. steamers.

The latter competed in several races and against time and fulfilled fairly well the prophecies of its speed. The former made good in sensational fashion in two time trials and proved itself one of the most marvelous speed vehicles that has been built. The Cannon, however, was not allowed to compete in any of the races and was further warned that no time it made in either of its trials would be accepted as a record. Thereby hangs the most regrettable and debatable incident of the day's sport. Here are the facts:

Last year George C. Cannon, a student at the Lawrence Scientific School at Harvard University, designed and built a steam racing automobile, which was raced on tracks several times last season with success. This year, understanding that the racing rules required two men to a car in a race, the machine was remodeled by its designer so that the occupants sat tandem fashion—Mr. Cannon in front steering and his college mate, T.



HOWARD IN HIS STEAM RACING CAR.



HOLDEN'S ORIENT STRIPPED.



H. S. HARKNESS, 40 H.P. MERCEDES.

L. Marsalis, behind running the engine. Two men were thus in control.

When the boys presented themselves and their racer for the first race they were informed that the stewards had disqualified them from competition in accordance with the following A. A. A. racing rule: "A driver is the occupant of an automobile in a race who has the exclusive control." The reasons and argument of the stewards as given to the MOTOR AGE man by W. E. Scarritt and W. J. Stewart, respectively president and race committee chairman of the American Automobile Association, was that the rule was there, that ignorance of it excused no one, that copies of the rules were sent with the entry blanks and that no other course was left to them under the rules than disqualification.

Inquiry was made of Frank G. Webb, of the L. I. A. C. race committee, by your correspondent as to why previous warning had not been given the Harvard boys, who had been practicing on the track the day before with their machine, presumably under the inspection of the committee for more than a day. Mr. Webb replied that printed photographs did not show the method of control and confessed to ignorance of the existence of such a rule.

The Harvard boys pleaded ignorance of the rule, complained of not being warned ahead and said that had they received warning in time the racer could easily have been changed to single control. Mr. Cannon is said to have further agreed that the passenger on the gasoline cars invariably pumped oil and so participated in the control of the machine. The college lads, however, accepted their disqualification gracefully and only asked that they might be given a chance at a time trial. This was granted with the warning that no record they made would be accepted by the A. A. A.

The performances of the Cannon, however, were the feature of the day. On its first trial early in the day, when the wind was strong, it covered the mile in 1:08 3-5. At the conclusion of the programme another try was made under more favorable wind but less favorable temperature conditions. This time 1:07 3-5 was attained—with 15 2-5s. for the quarter, 33 2-5s. for the half, and 50s. for the three-quarters. The steam automobile records are: Circular track, 1:39, by T. E. Griffin, Chicago (Locomotive), September 18, 1900; straightaway on road, 1:12, by S. T. Davis, Jr. (Locomotive), Staten Island, May 30, 1902. Serpollett's steam record for the kilometer (0.621 miles), made this spring, is 29 4-5. Cannon said the throttle was open only one quarter, as he never dared to throw it wide open. This racer arrived at Staten Island on May 30 last too late to compete against the Baker torpedo electric. And, by the way, the Baker was operated by two men and the Staten Island trials were run under A. A. A. rules and sanction, and there was no disqualification of the Baker or refusal to accept its record even hinted at.

There were other records made that worked a notable raise of the circular track time standards.

F. A. La Roche, driving Charles D. Cooke's 35-horse-power Darracq in the middle weight gasoline class,

established an entirely new set of track records, supplanting those made by Percy Owen (Winton) at Providence, October 18, 1901. His times were: One mile, 1:24; 2 miles, 2:42; 3 miles, 3:59 3-5; 4 miles, 5:20 2-5; 5 miles, 6:42.

Jacques Longuevez (De Dion) in the light weight gasoline class, made 6:51 3-5 for 4 miles and 8:30 2-5 for 5 miles. These supplant the records made by C. J. Field at Guttenburg, N. J., September 18, 1900.

If the Cannon record be not allowed, then the world steam record of 1:09 3-5, both track and straightaway, goes to J. W. Howard (Howard), who scored it in a trial against time just following Cannon's first attempt.

H. S. Harkness (40-horsepower Mercedes Simplex) failed to lower Alexander Winton's track records for heavy gasoline vehicles. Mr. Harkness made 11:54 4-5, as against the Winton machine's 11:09 for the 10 miles, scored at Detroit, October 24, 1902. In a trial at the close of the races Mr. Harkness covered a mile in 1:09, unofficial time.

The racers were not evenly matched and the races were not close. The closest was won by a quarter of a mile and the most unevenly matched pair were 2 miles apart at the end of a 5-mile race. The contests were such one-sided affairs as hardly to be worth setting forth with any details further than those the summary contains. Before the half-mile pole was reached it was manifest how the racers would finish and the only question left undecided was the distance they would be apart at the end.

Summary of races:

Vehicles under 1,500 pounds, all classes, mile heats—First heat (steam vehicles), won by Thomas Holden, Jr. (Locomobile); L. E. Holden (Locomobile), second; L. A. Hopkins (Locomobile), third. Times in order: First, 2:01; second, 2:27 2-5; third, 2:31 2-5. Won by 300 yards. Second heat third 30 yards.

Second heat (gasoline vehicles): Won by L. P. Mooers (Peerless); L. E. Holden (Orient), second; Jacques Longuevez (De Dion), third. Time, 1:39 1-5. Won by 220 yards. Second heat third 600 yards.

Final heat: Won by Mooers by a quarter of a mile. Time, 1:38.

Five miles for steam vehicles—Won by J. W. Howard (Howard); Thomas Holden, Jr. (Locomobile), second. Time, 9:05. Won by a mile.

Five miles for gasoline vehicles under 1,000 pounds—Won by Jacques Longuevez (De Dion); L. E. Holden (Orient), second. Times: 2:01 3-5, 3:37 3-5, 5:14, 6:51 3-5, 8:30 2-5. Fourth and fifth miles are new track records. Won by 2 miles.

Five miles for gasoline vehicles from 1,000 to 2,000 pounds. Won by Charles D. Cooke (35-horsepower Darracq), with F. A. La Roche driving; Percy Burn (15-horsepower Winton), second. Times: 1:24, 2:42, 3:59 3-5, 5:20 2-5, 6:42, all new track records. Won by half a mile.

Ten miles, free for all classes and weights—Won by H. S. Harkness (40-horsepower Mercedes-Simplex); Charles D. Cooke (35-horsepower Darracq), driven by F. A. La Roche, second; L. P. Mooers (Peerless), third. Time for 5 miles: 6:02 2-5, 7:13 2-5, 8:24 1-5, 9:34 1-5, 10:44 2-5. Won by a mile and a half. Second beat third a half mile. J. W. Howard (Howard), led at the mile in 1:15 1-5, was passed by Harkness at a mile and a half, and stopped at 2 miles. La Roche, 13:11 4-5; Mooers, 15:17.

Unlimited pursuit race—Won by H. S. Harkness (40-horsepower Mercedes-Simplex); J. W. Howard (Howard), second; Charles D. Cooke (35-horsepower Darracq), driven by F. A. La Roche, third. Harkness caught La Roche at 4 1/4 miles in 6:18 and Howard at 5 1/4 miles in 7:13.

Obstacle race—Won by W. F. Murphy (Locomobile). Time 1:51 1-5.

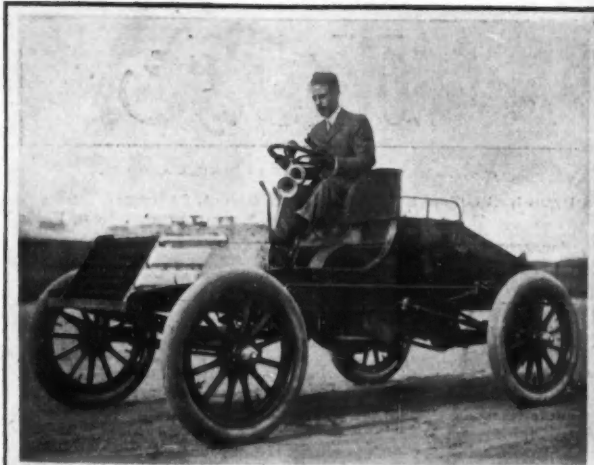
Summary of mile time trials:

George C. Cannon (Cannon)—First attempt, 1:08 3-5; second attempt, 1:08 3-5.

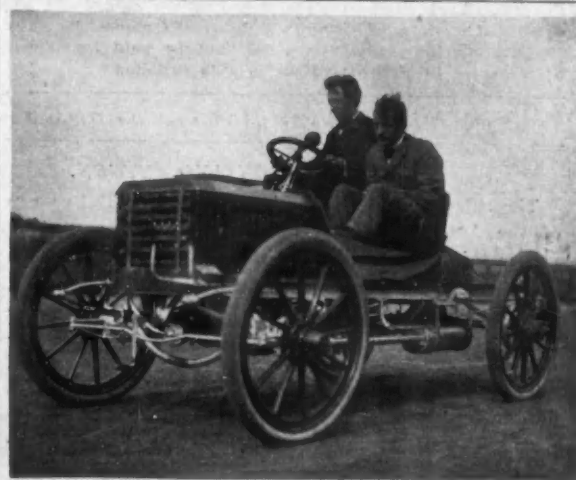
J. W. Howard (Howard)—Time, 1:09 3-5.

H. S. Harkness (Mercedes-Simplex)—Time, 1:09, unofficial.

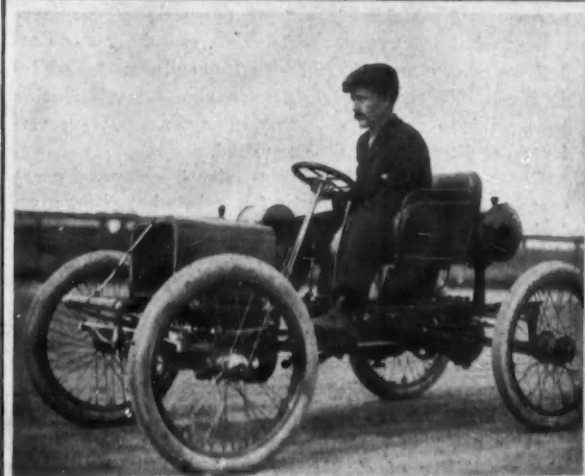
The heavyweight gasoline and the 25 mile lap races were not run.



PERCY OWEN IN HIS WINTON TOURING CAR.



MOOERS & WRIDGEWAY IN PEERLESS RACER.



LONGUEVEZ IN HIS DE DION RACER.

Motor Age

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The editor will be glad to receive communications for publication. They must be accompanied by the names and addresses of senders, which will not be used if request be made to that effect. Contributions will not be paid for unless accompanied by notice that payment is expected.

Subscription, Two Dollars a Year, - Six Months, One Dollar

NEW YORK TO BOSTON AND RETURN.

The rules of the New York to Boston reliability run of the Automobile Club of America are presented in full in this issue. They furnish interesting information to prospective contestants and an indication of what is expected of the various forms of vehicles by the pioneer club of the country, as represented by a committee of great experience.

They show, too, that a vehicle with 0.35 per cent of a horsepower per 100 lbs. of weight is expected to perform as well as another machine with double the power.

Comparison with the rules of last year show that considerable improvement is expected in the performances of all vehicles. The daily journeys are not more arduous but the conditions imposed, especially as to attention on the road, have been so amended as to render it impossible to make repairs or give other attention to a machine without suffering some penalty, the severity depending on the time required.

The rules show that the committee has devoted great care to their preparation but a few points have been overlooked. There are three important matters. The members of the committee, no doubt, gave them attention but all men cannot be expected to agree with their decision. They are the classification of machines by weight regardless of power; the fact that all vehicles, regardless of weight and power are required to accomplish the same performance; and failure to prevent the entry of specially-built vehicles.

It is probable that the committee gave attention to the possibility of classifying machines in some other way. There are two other possibilities, classification by price, as has been tried in Great Britain and by the dimensions of cylinders as compared with weight—in

other words, by the percentage of a horsepower to each 100 pounds of weight. The English plan might not operate successfully but there is much to be said in favor of the other. In connection with the Chicago run MOTOR AGE presented a table of performances which showed the percentage of a horsepower to each 100 pounds of weight of the principal carriages. It was, we believe, the first table of the kind ever published. It was based, however, on the rated horsepower, not on the dimensions of the cylinders. The committee in charge of the coming races of the Chicago club has about decided to depart from the time honored but ineffective weight rule and classify the vehicles as suggested above. The theory on which they are working is that if one machine can beat another, the cylinders and weight being identical, there must be something superior about the winner. If, therefore, one machine weighing 1,000 lbs., has a cylinder say $3\frac{1}{2} \times 4$ it should not be expected to perform as well as another of the same weight with a cylinder, say $4\frac{1}{2} \times 5$.

The committee will proceed on the theory, demonstrated by frequent tests, that regardless of compression and speed the mean effective pressure on the piston averages 25 pounds per square inch.

The New York committee, no doubt, considered the same plan. The cases are not exactly similar but they are so near it that, theoretically, the plan should operate successfully. It is surely unfair to ask a machine weighing a ton to compete with another weighing two, with the same power. It may be an easy matter for heavy machines to make 15 miles an hour over the road to be traveled and quite a difficult one for the lighter forms. Yet, according to the rules, a light machine which averages less than 12 miles, can receive nothing better than a second class certificate, indicating to the prospective buyer that the vehicle is, at best, a second class machine.

Under this plan it is difficult to understand the object of arranging the vehicles in classes. If a machine in B should, by good luck, good judgment or superior construction, make a better record than any machine in A, it would receive no extraordinary praise for the performance. It would simply be rated as a first class certificate winner in B, of necessity an inferior class to A.

The same rule makes it possible to enter a machine built especially for the contest, with a view to speed but with little carrying power or endurance beyond the week. The purpose of the event, surely, is to determine the reliability of standard patterns, or at least machines which are to be bought, at all times, in the open market. If the competing machines were all made up for the occasion, the event would demonstrate nothing of value to the automobile fraternity. The fact that a racing machine can cover the route to Boston and back without breaking down or giving more trouble than can be remedied at the controls during the morning hours, proves nothing about the regular product of the maker. Hence it might have been desirable to incorporate in the rules some provision relative to maximum power per 100 pounds of weight, to specify that the machines must

be of such character as those regularly supplied from stock or to provide a special class for special machines.

The wisdom of the committee is not in question. An innovation would be a serious matter in so important an event. The Automobile Club of America, as the pioneer institution, the one to which all others have heretofore looked for inspiration in the matter of rules, can afford to make no mistakes. The old system worked fairly well. At any rate it caused no trouble among the makers. But the new plan should and will be tried. If found successful it should be adopted in future contests. It may be that the Chicago theory is all wrong but the club will try it, not only on the occasion of the races in September but in earlier trials, and hopes to be accounted the pioneer in a perfectly fair form of classification.

By a singular oversight no provision is made in the rules for motor bicycles or motor cycles of any sort unless the riders sit side by side. Rule 2 provides that the contest is confined to self-propelled vehicles with the riders so seated. It makes no exceptions in the case of motor cycles. Rule 4 establishes a motor cycle class but makes no exception to the requirements of the earlier rule. This is, of course, an oversight and will undoubtedly be remedied.

The entry blank must state, as explained by rule 3, the weight of the vehicle, including fuel supplies, and equipment; water and gasoline capacity and the number of passengers the vehicle can carry. It does not explain whether the weight refers to the vehicle as it will be equipped for the contest, whether extra gasoline or water tanks may be added, or whether the vehicle must carry the full number of passengers. These points are interesting and, indeed, essential, in the preparation of a critical report of the performances of the cars. The "rated horsepower" is another requirement of this rule, a senseless thing which has no real value to anyone and is deceptive to not a few.

This year official observer may render any assistance in his power to the operator, the only restriction being that he may not become the driver of the vehicle. The rule may work to the advantage of one competitor and to the disadvantage of another. The observer on one car may be a man familiar with all its details and therefore capable of rendering prompt and valuable aid. In another case the observer may know nothing about the vehicle and be practically useless, except as a messenger or a tool bearer. The wisdom of this rule is at least open to question. Whether passengers may render assistance is not stated.

There are to be no traveling repair shops and no changes of boilers, wheels, engines or axles. Local assistance may be invoked during 2 hours before the start in the morning. Here, again, small carriages and late starters will be at a disadvantage. The high-powered machines will probably arrive first. In the event of their needing anything in the line of repairs it may be taken for granted that all the best local talent will be pressed into service so promptly that the late comers will be obliged to employ inferior talent or none at all.

The plan of marking the vehicles for reliability is ideal, except, as before stated, that allowance ought to be made for the smaller cars. A perfect performance would require the vehicle to be on the road 1,953.6 minutes. That time would mean an exact average of 15 miles an hour. For every minute over that time one point will be deducted from the vehicle's score. The certificate awarded will state the percentage of points scored by the vehicle. But there will be vehicles with as low as .35 per cent of a horsepower per 100 pounds of weight. There will be many running as high as .80 per cent and some a great deal higher. Would it not manifestly be fair to allow the smaller machines longer time in which to complete the journey and still win first class certificates in their class?



The popularity of the automobile among the masses and, to no small extent, the present comparative perfection of the machine are due to the demands of men who have an abundance of money wherewith to gratify their desire for novelty. Wherever there may be an event on European soil there will be found the ubiquitous American ready to purchase the winning machine. It is no exaggeration to say that the American with his

purse at the liberty of the winner is not infrequently the one prize worth gathering. And there you are—in his case at least it is speeding or racing that lures from our shores not a little of our best patronage. But it may be safely predicted that in a short time the most fastidious moneyed American will be proud to parade the product of his own country abroad—as proudly as he will the superiority of its other industrial products.

Charles Jarrott, whose Phenomenal Records in France and England Have Made Him the Foremost Automobilist and Record Holder of the Day.



Winner of the Ardennes Circuit Race of 318 Miles and Holder of the Kilometer Record of $28\frac{1}{5}$ Seconds, Supplanting that of Vanderbilt.

Fournier, Vanderbilt and all the other racing celebrities have been outdone by Charles Jarrott, a young Englishman who has been an enthusiast at everything from the motor bicycle upward since the automobile was introduced into England. He has owned and operated a number of cars and, during last season, took part in many events without signal success. This year he has been operating a 70-horsepower Panhard. His first great victory was in the Ardennes circuit, in which he defeated all comers, Vanderbilt included, covering the 318 miles at an average speed of 54 miles an hour. He then returned to England and made the best time in the Welbeck trials. Finally he has placed the kilometer record at $28\frac{1}{5}$ s., supplanting Vanderbilt's $29\frac{2}{5}$ s. made a couple of weeks earlier. This last performance was accomplished on the 22d and was, it is assumed, officially timed, though there has not been time to ascertain all the details of the performance. The latest English papers intimate that the course was slightly down hill, in which event the record cannot be accepted as official.

The Welbeck trials were held on the estate of the Duke of Portland, on a piece of good road placed at the disposal of the automobile club because of the refusal of the authorities at Bexhill to permit a repetition of the events of last spring. Jarrott's best performance was 35 seconds. None of the other performances were startling, the best being 44 seconds by an 18-horsepower Decauville, a speed of 50.80 miles an hour.

Successful Racing at 'Frisco.

At a race meet promoted by the San Francisco Cycle Board of Trade on the 17th the principal event was a 5-mile race between a Locomobile and a Winton, operated respectively by George Moore and W. E. Saunders, the former winning in 9m. 54.2-5s. C. L. Hill won a 3-mile motor cycle handicap from scratch and B. B.

Stanley a mile race for Oldsmobiles. Finally Moore won the 2-mile race for steam carriages from two competitors by about 100 yards. The association was so encouraged by the success of the racing that it promises other events at an early date.

Clevelanders Try Pace Judging Contest.

Cleveland, O., Aug. 25.—Cleveland's first automobile meet, and what is claimed to be the first matinee club meet in the country, was an unqualified success, and the indications are that when the "real thing" in the shape of stellar attractions from all parts of the country are presented the attendance will be large. The meet was held at Rockport track, almost 10 miles from the city, and it was not advertised except by brief notes in the daily papers. Despite this the attendance was over a thousand and the most select in town. There were over fifty automobile parties with from two to six in a machine. It was the largest aggregation of vehicles ever seen together in Cleveland. The star attraction was Winton and his Bullet and there was no disappointment in this. The veteran and his latest flyer negotiated 5 miles in $7:25\frac{1}{2}$, the time by miles being $1:31\frac{1}{2}$, $1:29\frac{1}{2}$, $1:30$, $1:28$, $1:26\frac{1}{2}$. The last mile is said to have been the fastest ever made on a half mile track. In a match race between Winton and C. B. Shanks, both using Winton touring cars, the latter won easily, as Winton's machine was an old one and lower geared than the other. Winton's machine went wrong at 4 miles. Shanks finished the 4 miles in $7:37$. The much talked about match race between Shanks and E. Shreiver Reese, the former driving a Winton touring car and the latter a new Locomobile, proved a decided farce. The steamer seemed to go wrong at the start. At any rate Reese never was in it and will pay for the supper for all of the members. The novelty of the day was a contest in which ten club members participated. The

idea was to see which could come the closest to a mile in 3 minutes, no watches permitted. No one was able to strike the mark exactly, but H. P. Dyer with a Winton made it in 3:02. Ralph Worthington, with a White, and Shanks, with his Winton, were tied for second, making the round in 2:57. Winton, with his Bullet, was so accustomed to a 2-minute clip that a 3-minute speed was more than he could imagine and his time was 3:36, the worst of the lot. A match between Ray Owen and James Moore, driving well matched Oldsmobiles, was closely contested. Moore won by a foot in 2:24.

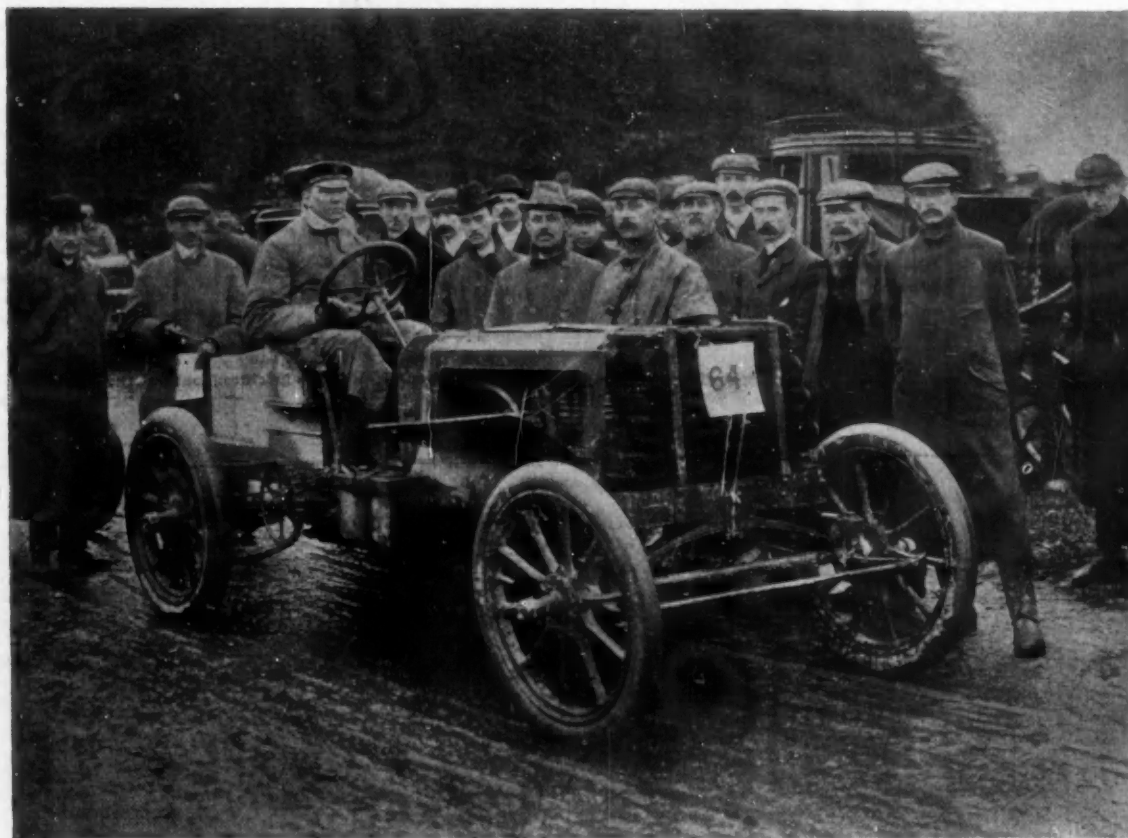
Chicago's Scientific Race Meet.

The race committee of the Chicago Automobile Club has selected Joliet as the place and September 27 as the date of the club's second annual fall race meet. The date follows, as nearly as possible, the events at Detroit and Cleveland and the management of the three meetings will co-operate in an endeavor to induce the best talent available to journey westward and compete. The club's first meeting was held at Joliet. The club was so well treated by the local enthusiasts and the track was so superior to anything else available that the committee hailed with delight a proposal to hold the

coming meeting at the same place in conjunction with the annual carnival of the Elks. The town will be en fete during the entire week and some event will be arranged for Friday, the day before the races, so that visitors may take advantage of a three days' outing. The local matters will, as last year, be in the hands of W. C. Crolus. The prizes will all be cups. No money will be offered. As to the list of events the committee has been at work on a new plan of classification. Definite information as to the list will be ready in a few days, but it will be, approximately, as follows: One mile for standard, stock steam machines; 5 miles, steam vehicles, all classes and weights; 1 mile open, electric; 1 mile, gasoline vehicles, with between 0.35 and 0.50 horsepower per 100 pounds of weight; 5 miles, gasoline, between 0.50 and 0.70; 10 miles, gasoline, over 0.70; 10 miles, open, all classes and weights; pursuit race, 0.35 to 0.50 class, time limit 30 minutes; 5-mile handicap, all classes, 1 mile limit; club race, distance and details not yet arranged.

To Crush a Great Monopoly.

A substitute for gasoline, safe, cheap, compact, without odor, is alleged to have been discovered by W. H. Russel, a New York chemist. Al. Reeves, secretary of



CHARLES JARROTT AND HIS 70 HORSEPOWER PANHARD AT THE WELBECK TRIALS.

the National Cycling Association and automobile editor of the Mail & Express, vouches for a part of the story. He reports that he "examined and operated the machine which has served as a working model for the new power. It is rather a crude affair, which makes its operation even more creditable. A carriage body has been placed on the frame of an ordinary quadricycle, to which is attached a Canada gasoline motor, said to be of 2½ horsepower. The important factor in the carriage is a round tank of tin about 15 inches long and 8 inches in diameter, carried in the body just back of the seat. It contains chemicals for creating the gas and the tank and fittings do not weigh more than 8 pounds. From the end of the tank a ¾-inch pipe runs along the right side of the body to the dash-board, where there is a valve to regulate the flow of gas and an opening which draws in the air. The pipe runs back, inside of the body, to the motor. An air syphon is attached to the left end of the gas reservoir which draws in the air that acts on the chemicals. The engine is turned over by the pulling of a lever from the seat, similar to the method employed on all gasoline carriages. The ignition is governed by a small sliding rubber block in the steering rod, enabling the operator to increase or decrease his speed by advancing or retarding the spark. The speed can also be regulated by operating the valve of the gas supply pipe. Except for the absence of any odor, the machine in operation appears the same as any gasoline automobile. When the engine starts it draws air to the chemicals, which generate a gas. This is forced through the pipe, taking in air near the dash and the complete mixture enters the motor and is exploded under compression by a spark from a dry battery."

Mr. Russel says that "hydro carbon and chemicals" form the basis of his discovery and that the admission of air thereto is all that is necessary. Half a cent per horsepower hour is his estimate of the cost and 150 miles the capability of the 8x15 tank.

* A Fool Experience.

An incident occurred recently which well illustrates the wisdom of the old saying that "five minutes of earnest thought are worth more than an hour's hard work." One of the front wheel steering knuckles of an automobile broke off short, next to the hub. The operator knowing that he could readily get a new steering knuckle in stock at a certain supply house, took out his monkey wrench and proceeded to loosen the lock nut which kept the hub in place on the spindle of the steering knuckle. Unfortunately for him he did not take advantage of the old saying quoted above, and failed in the attempt. Thinking that his wrench was not sufficiently large, he called for the services of a blacksmith who advanced to the fray, armed with a monkey wrench at least 2 feet long and of gigantic proportions. At least 55 minutes were spent fruitlessly and then it was decided to impress an express wagon into service and take the wheel to a repair shop. After getting it there the foreman was informed that

he had an awful job on his hands but smilingly told the owner that it would only take a few minutes. A bet was accordingly made on the result. Whether it was paid or not is not a matter of history. The foreman called one of his men and said: "Jim, I will give you just 5 minutes to get that spindle out of the hub." The job was accomplished in 50 seconds and thereby hangs a tale. It was a left hand thread.

Good Dinner Was Helpful.

At a dinner given in honor of the road committee of the Essex county board of freeholders by the Automobile Club of New Jersey at Pompton Plains last week nearly every member of that board went on record as favoring the granting of a speed of 20 miles an hour to automobiles outside the limits of the city. Some were outspoken in their favor of granting a speed of 30 miles, while the most conservative ones would agree to a limit of only 20, with a possible addition of 5 miles if thought proper. The trip to Pompton Plains was made in automobiles, the members of the board of freeholders agreeing to put on all speed. In fact, several of them suggested faster speed, remarking that it was no fun riding slowly. In speaking of the matter W. J. Stewart, secretary of the New Jersey Automobile Club, said that it was the purpose of the club to clearly demonstrate the mechanism of the automobile to the board of freeholders and to show them the exact extent to which the machine could be controlled.

New Incorporations and Enterprises.

PORTLAND, IND.—One of the latest ventures is on the part of a company organized here under the name of the Portland Transit Co., and capitalized at \$10,000. It is the purpose of the incorporators to run autos between Portland and Camden, which is a distinctly inland town, there connecting with the machines of the Dunkirk and Redkey Mobile Transit Co. The new organization is on a solid foundation, and is made up of the following representative persons: Judson A. Jaqua, of the Citizens' Bank; Ed. V. Fitzpatrick, county clerk; Truman O. Boyd, auditor of Jay county; Oliver N. Eller, superintendent of the city's water and electric light plants, and Walter F. MacGinnitie, of the law firm of Taylor, MacGinnitie & Taylor.

AUBURN, IND.—The Interurban Motor Co. has been incorporated to operate an automobile bus and transfer line between Auburn, Garrett and Waterloo. W. H. McIntyre is at the head of the concern, which has \$5,000 capital stock.

TOPEKA, KS.—Joseph Bittiker, a western Kansas plainsman, has ordered an auto that will carry ten persons to use in covering his mail route from Hartland to Hugoton. The distance is 65 miles, and five towns are on the route. There are no railroads in southwestern Kansas and the country is level as a floor. Fifteen years ago several large towns lay on this route, one of which, Springfield, had a system of waterworks. Now the 100 water hydrants, standing like sentinels in the prairie, mark the town site, not a building remaining.

WICHITA, KS.—Plans are being made by fifteen or twenty property owners in the southeast part of the city to establish an automobile line to run from the corner of Main and Douglas to Linwood park. N. J. Waterbury is one of the men who is in the scheme. The stock of the company will consist of 200 shares at \$25 each. This means a capital of \$5,000.

Rules for the New York-Boston Reliability Test.

Oct. 9.—New York to New Haven.—Luncheon at Norwalk
 " 10.—New Haven to Springfield. " " Hartford
 " 11.—Springfield to Boston. " " Worcester
 " 12.—Sunday in Boston.
 " 13.—Boston to Springfield. " " Worcester
 " 14.—Springfield to New Haven. " " Hartford
 " 15.—New Haven to New York. " " Norwalk

The Automobile Club of America has organized the 500-mile reliability contest to Boston and return with a view of affording an opportunity for the various types of motor vehicles to demonstrate their reliability under circumstances as closely as possible simulating general touring conditions in the United States.

The contest committee desires to lay especial stress on the fact that speed in excess of the legal limit will be absolutely prohibited under pain of disqualification, general reliability being the underlying feature of the contest.

The performance of each vehicle, as noted by the official observer, will be carefully recorded and published after the contest.

RULES AND REGULATIONS.

I.—It will be assumed that every contestant is acquainted with the rules of the contest, and by entering therein he agrees to abide by said rules. In the event of dispute concerning the interpretation of the rules, the decision of the contest committee shall be final. The committee reserves the right to alter or amend these rules from time to time as it may deem expedient.

II.—The contest will be open to all classes of self-propelled vehicles, made in the United States or abroad, so constructed that at least two passengers are carried seated side by side, but no manufacturer, agent or private owner shall be allowed to enter more than three vehicles in any one class. Entry blanks will be forwarded by the club secretary upon request, and must be filled out in full.

III.—The time for receiving entries will expire on September 25, 1902. All entries must be accompanied by the following information in full: Weight of the vehicle, including fuel, supplies and equipment; water capacity; gasoline capacity; name of manufacturer; place of manufacture; tires—make, size, weight, double or single tube, retail price; number of passengers the vehicle can carry; motive power; rated horsepower of the motor and number of cylinders. For electric vehicles—Weight of battery; number of cells; ampere hour capacity. No entry will be received unless every question on the entry blank is answered, nor will any entry be received unless accompanied by the entrance fee.

IV.—The entrance fee for all classes, motor cycles excepted, up to and including September 10, 1902, will be \$50 for each vehicle. In the motor cycle class the entrance fee will be \$25 for each vehicle. After September 10, 10 per cent will be added to the entrance fee for all classes. The entrance fee shall be paid by check to the order of the treasurer of the club and be forwarded to the club secretary with the entry. Each person making an entry agrees that in the event of the vehicle being disqualified or failing to take part in the contest, the entry fee shall be retained by the club. The club shall have the right to refuse an entry without stating any reasons.

V.—All vehicles, whether electric, steam, gasoline or otherwise, shall operate in the same class, which classification shall be on the basis of weight.

VI.—Vehicles shall be divided into the following classes:

All four-wheeled vehicles to carry two or more persons. (Three-wheeled vehicles carrying two passengers side by side and conforming in all other respects to four-wheeled vehicles, to be provided for by special arrangement in Classes A or B). Class A—Under 1,000 pound class. Four-wheeled motor vehicles weighing under 1,000 pounds, in commercial running and operating condition, with all tools, fuel and supplies on board. Class B—1,000 to 2,000 pound class. Four-wheeled motor vehicles weighing 1,000 and less than 2,000 pounds, in commercial running and operating condition, with all tools, fuel and supplies on board. Class C—2,000 pound and over class. Four-wheeled motor vehicles weighing 2,000 pounds or over in commercial running and operating condition, with all tools, fuel and supplies on board. Class D—Motor cycle class. Motor bicycles, motor tricycles and motor quadricycles.

VII.—Electric vehicles may recharge or replace batteries at noon and night controls without penalty. All other rechargings or replacements will be counted as penalized stops, and the length of time thus consumed will be noted by the observer.

VIII.—All parties making entries for the contest shall appear before the committee at the Automobile Club on Tuesday, October 7, 1902, between the hours of 9 a. m. and 6 p. m., and after receiving their official number shall go to a place designated by the committee, and have their vehicle weighed and an official seal affixed thereto. The committee reserves the right, at the time of weighing, to reject any vehicle, if it seems fit to do so, and return the entrance fee.

IX.—Every vehicle shall carry an official observer who will be provided by the club. Each observer will be provided with a distinctive badge, bearing the official number of the vehicle in which he is to ride, which must be conspicuously worn on the outside of the coat. Observers will record the actual time of the start and completion of the contest, and also the time of all stoppages from the actual stop to the actual start of the wheels, from whatever cause, and the cause of each stop must be recorded in full on the record sheets with which they will be provided. Observers will also keep an accurate and detailed record of any repairs made to the vehicle en route, at the noon control, and during the morning hours from 7 o'clock a. m. to 9 o'clock a. m., allowed each day for repairs and adjustment. It shall be the duty of the official observer to caution the operator of the vehicle in which he rides when he has used less time between controls than that shown on the schedule, but any caution or lack of caution from the observer is not to relieve the operator of the vehicle from his responsibility concerning the speed. Should the observer's caution be disregarded, it shall be the duty of the observer to note this fact upon his record sheet. Observers may render any assistance within their power to the operator of the vehicle. The official observer for each vehicle will be assigned to the vehicle in which he is to ride one week in advance of the date of starting. He will be informed of the name and address of the owner of the vehicle and its official number, and be furnished with the rules and program of the contest, and a badge corresponding to the number of the vehicle. The owner of the vehicle will at the same time be advised of the name and address of the observer who has been assigned to his vehicle. If for any reason the observer finds he will be unable to start, he must at once notify the owner by telegraph of this fact, also the club secretary, and return his badge to the secretary, who will immediately assign another observer to such vehicle. If, on the other hand, the owner for any reason finds his vehicle will not be able to start, it shall be his duty to notify the club and also his observer of this fact by telegraph, and the observer can then report to the club secretary and receive another assignment. Each observer will provide himself with a watch, which he will set by the clock over the window of the Plaza Bank. He will also provide himself with a mackintosh and a small cap, and with lead pencils or a fountain pen. It shall be the duty of the observer to report to the vehicle

to which he has been assigned at 8:30 a. m. on the morning of the start and not leave it except during noon or night stops, or in case of illness. Should an observer at any time be incapacitated from continuing the run, he will turn over his time card and official badge to the operator of the vehicle, who will complete the record as far as the next control, where a new observer will be provided. Coupons for hotel accommodations at noon and night stops will be mailed to observers before the start. If during the progress of the run a vehicle in which an observer rides is for any reason unable to continue, the observer may take train to New York and at once turn in to the club: (1) Memorandum of the cost of his railway transportation, which will be paid by the club; (2) his unused hotel coupons; (3) his official time book. On the morning of each day of the run it shall be the duty of the official observer to report to his vehicle at the garage at 7 o'clock, when it is turned over to its owner, and remain with it as far as possible until it is ready for the start at 9 a. m. During this time he shall keep a record of all repairs made to the vehicle or replacement of parts. He shall also keep a careful record of repairs made en route throughout the entire run, note what supplies are taken on between controls, and for electric vehicles the time consumed in recharging or replacement of batteries. At the noon control the observer must also record any repairs that may be made during the stop for luncheon. On arriving at the night control the official observer shall remain with his vehicles until its tanks have been filled with water and gasoline, and it has been placed in the garage in charge of the committee's guards. No adjustment or repairs are to be made on the vehicle on arrival at the night control or while it is receiving water and gasoline. The observer will sign and surrender his record book to the timekeeper in New York immediately after the finish of the contest.

X.—Controls are to be officially established at the beginning of each day's run, at luncheon places and at the end of each day's run. The start is to be made each morning at 9 o'clock, and an hour and a half will be allowed for luncheon, except that any contestant arriving at the noon control at 1 o'clock or after will be allowed but one hour for luncheon. He will be called one hour after the time of his arrival, and his time will be counted from the time that he is called; but no vehicle will be allowed to leave the noon control before 2 o'clock. During the luncheon hour at the noon control contestants may take on fuel, which will be available, and make such adjustments and repairs as can be accomplished with the tools and extra parts carried on the vehicle, and with such local assistance as may be readily obtained under ordinary touring conditions, but will not be permitted to have work done on their vehicles by their mechanics or assistants traveling by train. The times for opening and closing controls will be modified according to the conditions which may arise during the contest. The noon control will open at 11 a. m. and close at 4:30 p. m. The night control will open at 4 p. m. and remain open until 9:30 p. m. The time of arrival of each vehicle at the point of control will be recorded by the officials at control on the record sheets, and also on the record book of the official observer of the vehicle. The site of control will be designated by a red flag with the word "Control" prominently printed thereon in black. This flag will be prominently displayed on both sides of the road at the point of control. There will be notification by means of a green flag 200 yards in advance of the control point as a warning of the approach to the control. Controls are to be established in the following manner: If a green flag is displayed, the vehicle shall slow down to a speed of not to exceed 8 miles per hour until a white flag is passed, when speed may be resumed as before. On coming to a red flag, the vehicle shall come to a full stop until the driver is permitted by the steward to proceed. At night, lanterns similarly colored may be used instead of flags. There will be at each night's stopping place a storage enclosure in charge of a superintendent and assistants, for the storage of vehicles

for the night. Watchmen will be on duty during the night. On the arrival of each vehicle at the night control its tanks must be filled with water and gasoline on the street outside of the storage enclosure or garage, when supplies will be available, but the vehicle shall receive absolutely no other attention and must be immediately placed in the garage. All fires on steam vehicles, all lamps used for ignition and all lamps used for illumination must be extinguished before the vehicle is placed in the garage. At 7 a. m. each contestant may take his vehicle and under the eye of the official observer make such lubrication, adjustments and repairs as may be necessary. No one will be permitted to enter the garage except the official observer, the owner or driver of a vehicle and his mechanic and such local assistants as may be employed. Contestants will not be permitted to have mechanics or assistants traveling by train to do work on their vehicles. No fires on steam vehicles, no lamps for ignition or illuminating purposes on automobiles are to be lighted in the garage during the morning hours allowed for repairs or adjustment. Smoking in the garage will be strictly prohibited at all times. Each vehicle shall be ready to start at 9 a. m. sharp. If a vehicle is not ready to start when it is called, time will be taken for such vehicle and any delay in starting will be charged against it. The club has made arrangements for an adequate supply of gasoline at the noon and night controls which may be purchased by contestants. Contestants will make their own arrangements for lubricants. Contestants needing supplies at other than the noon and night controls will be required to make their own arrangements for same. Official observers will note what supplies are taken on between controls.

XI.—No replacing of engines, boilers, axles or wheels will be allowed. Such repairs only will be permitted as can be accomplished with the tools and extra parts carried on the vehicle and with such local assistance as may be readily obtained under ordinary touring conditions.

XII.—Vehicles will be started from the control the first morning at 9 o'clock. At the time of starting from each control, the vehicles shall approach the starting line and take their places one behind the other in the order of their approach to the starting line, leaving a space of at least ten feet between every two vehicles. As each vehicle starts, the others shall move up one place. Vehicles approaching control points shall follow the same rule as at starting points. If it becomes necessary for a vehicle to stop, it must first be driven to the extreme right of the road as nearly as practicable. All stops from whatever cause will be timed and recorded by the official observer. Stops for the following causes will be considered involuntary stops and will not count against the vehicle, although such stoppages must be recorded as set forth above: (1) Compulsory stop of 1½ hours for luncheon, which will be made at specified places indicated in the program; (2) road blocked by traffic; (3) tire troubles (see Rule XIV); (4) stoppages by police; (5) to avoid frightening timid horses; (6) to render aid in case of accident; (7) blocked railroad crossing; (8) demands of nature; (9) to recover articles accidentally dropped from vehicle; (10) to light carriage lamps. Steam vehicles will be allowed a total of 20 minutes' stoppage for gasoline and water between controls in each half day's run, for which marks will not be deducted. One mark per minute will be deducted for time thus consumed in excess of 20 minutes.

XIII.—There will be a maximum number of marks for reliability for each day's run, viz:

1st day—New York to New Haven..	79	miles	316.	marks
2nd day—New Haven to Springfield..	68.6	"	274.4	"
3rd day—Springfield to Boston.....	96.6	"	386.4	"
4th day—Boston to Springfield.....	96.6	"	386.4	"
5th day—Springfield to New Haven..	68.6	"	274.4	"
6th day—New Haven to New York..	79	"	316.	"

Total1,953.6

This number is based on an average speed of 15 miles an hour or 4 minutes to the mile. The maximum number of marks for each day's run is ascertained by multiplying the

number of miles by 4. Thus New York to New Haven, 77 miles x 4 equals 308 (minutes) marks, which represents a clean run at an average speed of 15 miles per hour, and one mark will be deducted for each minute the vehicle is at rest from the time of starting to the conclusion of a day's run, except the involuntary stops mentioned in Rule XII. Thus if penalized stops amounting to thirty minutes are made during the day, 30 marks are deducted; 308 minus 30 equals 278 total reliability marks for the day. In like manner if a vehicle on account of slower speed takes more than 308 minutes to cover the 77 miles (exclusive of involuntary stops) one mark is deducted for each minute in excess of 308 minutes. A cup, presented by the president of the club, will be awarded by the committee to the vehicle showing the greatest number of reliability marks at the end of the contest.

XIV.—Stoppages on account of tire troubles will not be counted against a vehicle. An accurate record, however, will be kept of all delays occasioned by tires. Such record will be published in the official report of the contest and will state the exact nature of the mishap and the time necessary to repair the same. The entry blanks will require specific information of the tires on each vehicle, including maker's name, retail price, size, weight, and whether single or double tube.

XV.—An average speed of 8 miles per hour (exclusive of the non-penalized stops mentioned in Rule XII.) must be maintained over the whole course to render a vehicle eligible for a certificate. A contestant falling below an average of 8 miles per hour in any period (half-day's run) will not receive any credit for that period. On passing a green flag, which will be placed on the right side of the road at the entrance to all towns, on the outward journey, no speed in excess of 8 miles per hour will be permitted until a white flag is reached, when a speed not exceeding 15 miles an hour will be permitted. No average speed for each day's run in excess of 15 miles per hour will be recognized or permitted. Vehicles are not permitted to make up the time lost during penalized or during non-penalized stops by exceeding an average rate of speed of 15 miles per hour, but the time lost during non-penalized stops will be credited upon arrival at controls. The contest committee shall have power to disqualify a vehicle for traveling at a speed, in any place, which they may consider excessive, without reference to these rules. Any driver, owner, nominator or manufacturer of any vehicle taking part in the contest who shall be disqualified shall have his or their names reported to the secretary of the American Automobile Association, and such driver, owner, nominator or manufacturer will be disqualified by said association.

XVI.—There will be no restriction as to operators of vehicles, but no change of operators will be permitted except within the confines of a control.

XVII.—In classes A, B and C each vehicle shall carry at least two persons, one of whom shall be the official observer appointed by the club. These may be changed and others substituted within the confines of any control, but if passengers be changed outside of control, the vehicle shall be subject to disqualification.

XVIII.—Each contesting vehicle must have securely attached to it in a conspicuous position on both front and rear or side, an official letter and number corresponding with the catalogue class and number. There shall be no other mark or sign on any vehicle other than the owner's initials and the manufacturer's usual name or number plates as affixed to a vehicle when sold to a customer. Those having charge of vehicle will be held responsible for the numbers being in conspicuous positions and clearly legible at all times.

XIX.—All vehicles passing other vehicles going in the same direction must pass to the left in accordance with the rules of the road, and vehicles meeting each other must pass to the right. If for any reason it is necessary for vehicles to travel on the left side of the roadway, such vehicles must cross to the right side, irrespective of the condition of the

roads, as soon as signalled by an overtaking or an approaching vehicle. Vehicles must signal one another when approaching in either direction. No vehicle shall be pushed or assisted by any one other than its occupants under penalty of disqualification, except that the penalty for a vehicle being towed in any period shall be disqualification for that period (a period being a half-day's run). Contestants shall be responsible for any violation of law and for all civil and criminal penalties. Contestants must comply with the traffic regulations of the local police. If a contestant fails to stop his vehicle on request from the driver of a frightened horse, or in any manner shows himself inconsiderate of other users of the roadway, his vehicle shall be subject to disqualification. Contestants shall inform themselves thoroughly in regard to the route, and no allowance will be made for any mistakes they may make. No contestant shall take any route other than that laid down in the official maps, which will be furnished for each stage.

XX.—Every vehicle will be required to have an efficient muffler which must be attached to the vehicle. Running with open mufflers will not be permitted.

XXI.—Disqualification shall mean that on notice being served on any vehicle, it shall cease to run in the contest, and shall not receive a certificate or mention in the records. A person on receiving notice of disqualification shall withdraw his vehicle and immediately remove the official number therefrom. No notice of disqualification shall be served unless the person in charge of the vehicle has first been notified of the act which it is claimed should disqualify the vehicle. If the act be disputed, disqualification shall be postponed until the contest committee, at a meeting to which all concerned shall be invited, shall take evidence and render their decision. The person so disqualified shall have no claim on the club of any kind or nature, whatsoever.

XXII.—Any one desiring to enter a protest must deposit with a member of the committee ten (\$10.00) dollars, which sum will be retained by the club if the protest is not sustained. He must submit his protest in writing, within twenty-four hours of the time, when it will be considered by the committee at the earliest practicable moment and decision rendered.

XXIII.—The committee shall post the result of each day's run as soon as practicable, and may furnish the same to the press. Contestants shall not publish or communicate for publication any other times than those contained in the club certificate. In the event of subsequent alteration by the committee of the records on the certificates, owing to protests or other causes, the contestant will only publish the record as amended, on pain of disqualification. The certificates will recognize no speeds in excess of 15 miles an hour, and will state as follows: Official number; class; maker; entered by; weight; tires, make, weight, size, single or double tube and retail price; number of passengers carried; distance; average miles per hour for the six days; percentage of reliability mark.

XXIV.—Certificates will be awarded by the club as follows: First class certificate, average speed from 12 to 15 miles per hour; second class certificate, average speed from 10 to 12 miles per hour; third class certificate, average speed from 8 to 10 miles per hour.

XXV.—The total distance is to be divided into stages for each day as follows:

	Miles.
1st stage—From club house to New Haven...	79
2nd stage—From New Haven to Springfield...	68.6
3rd stage—From Springfield to Boston.....	96.6
(Remaining in Boston one day.)	
4th stage—From Boston to Springfield.....	96.6
5th stage—From Springfield to New Haven...	68.6
6th stage—From New Haven to New York....	79
Total	488.4

XXVI.—The finish of the contest will be made at the flag in front of the club house, No. 753 Fifth avenue, corner of 58th street, New York.

Locomotive Type of Automobile Running Gear

Some time ago an eminent authority on mechanical subjects, in an article discussing the subject of self-propelled vehicles, very properly spoke of the automobile as the "trackless locomotive of the future."

Manufacturers of the early self-propelled vehicles, or horseless carriages, as they were then designated, endeavored to keep strictly within the lines of horse-drawn vehicles, and every attempt was made to conceal the machinery and operating mechanism so as to give the carriage the appearance of one from which the horse had just been unhitched. In this the makers followed the lead of designers of early forms of railway carriages.

Later in the progress of the industry manufacturers attempted to satisfy public opinion and get away from horse-drawn lines, and the earlier types of motor vehicles were the result.

Little over a year ago the first actual automobiles were introduced into this country from France, and today American manufacturers have almost entirely discarded the horseless carriage effect and are turning out full-fledged automobiles.

It is by no means reasonable to suppose that because we are now producing as fine designs as any nation we have reached finality or are likely to do so for many years. The accompanying drawings, for example, show a possibility. They show a modification of a type of running gear which is now being built in Germany for

military purposes, and is of what is known as the locomotive type, having pedestals to support the front and rear axles and sustain the thrust usually carried by the spring and distance rods in vehicles at present used. With this style of construction a vehicle may be built capable of withstanding greater shocks and jars than the vehicles now in use, and still remain in working order after a long run over rough country roads.

Figure 1 is a side elevation, showing the running gear with body attached. It will be noticed that all the machinery outside of the motor and supply tanks is located below the top of the angle iron frame, a feature much to be desired in any type of automobile. The springs are semi-elliptic and are attached to the axles by spring blocks, which are shown in detail in Figures 3 and 4. The body proper starts back of the dash, so that it may be removed without interfering with the motor or supply tanks located under the hood or bonnet and in front of the dash.

Figure 2 is a detail of one of the pedestals which guide the front and rear axles and also receive all the thrusts occasioned by the rough places in the road.

Figures 3 and 4 show clearly the construction of the spring blocks which form part of the front and rear axle guides. Figure 3 is also the bearing for the rear axle. It is babbitted with No. 1 genuine babbitt metal and then bored to the size given in the drawing. It is provided with a boss on top with $\frac{1}{2}$ inch pipe tap, for compression grease cup. The spring block and guide for the front axle shown in Figure 4, is made in two parts and held together by means of two clips, made of 9-16-inch square steel, with $\frac{1}{4}$ -inch threads cut on their ends. The holes for these clips can be cored in the castings, so as to save machine work. Both sets of castings should be made of high grade cast steel.

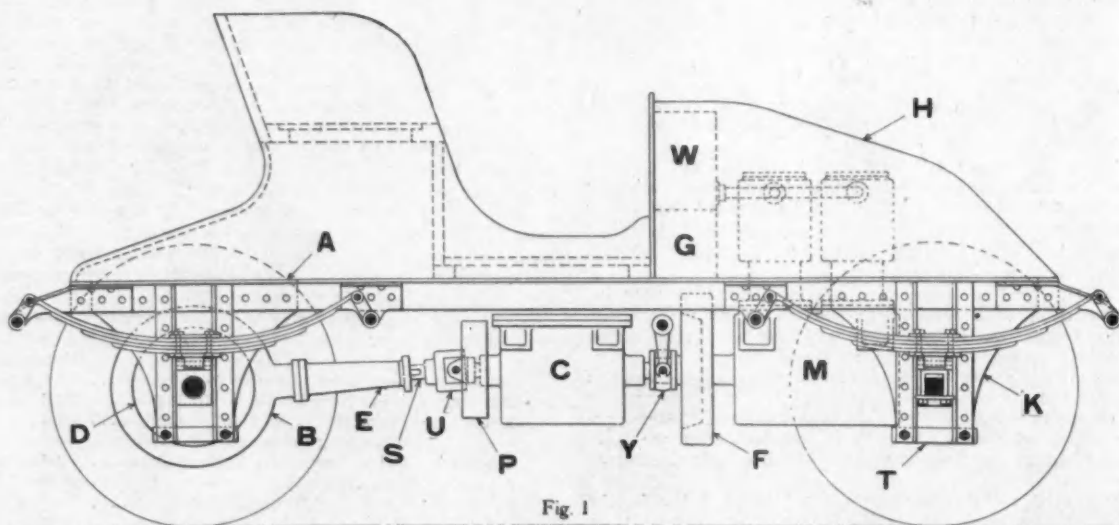


Fig. 1

A, angle iron frame; B, bevel gear drive to rear wheels; C, transmission gear; D, differential gear; E, extension bearing; F, fly wheel and cone friction; G, gasoline tank; H, hood over motor; K, axle guiding pedestals; M, motor; P, brake pulley; S, sliding shaft; T, tie bars; U, universal joint; W, water tank; Y, friction clutch yoke.

Figure 2.

A, 3x3x $\frac{3}{8}$ angle iron frame; J, 2x2x $\frac{3}{8}$ angle iron pedestal jaws; K, $\frac{1}{4}$ x8 $\frac{1}{4}$ x16 pedestal plates; L, $\frac{3}{8}$ x2 tiller plates; T, $\frac{3}{8}$ x1 $\frac{1}{2}$ tie bars.

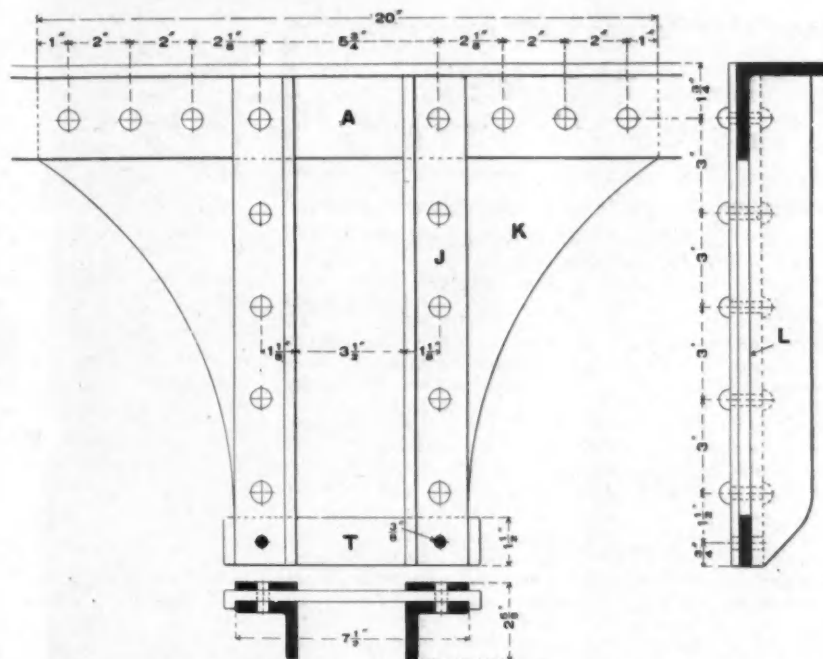


Figure 3.

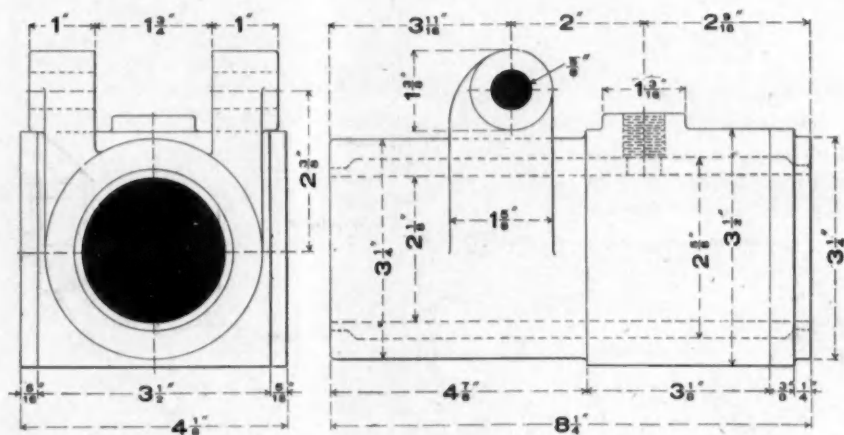
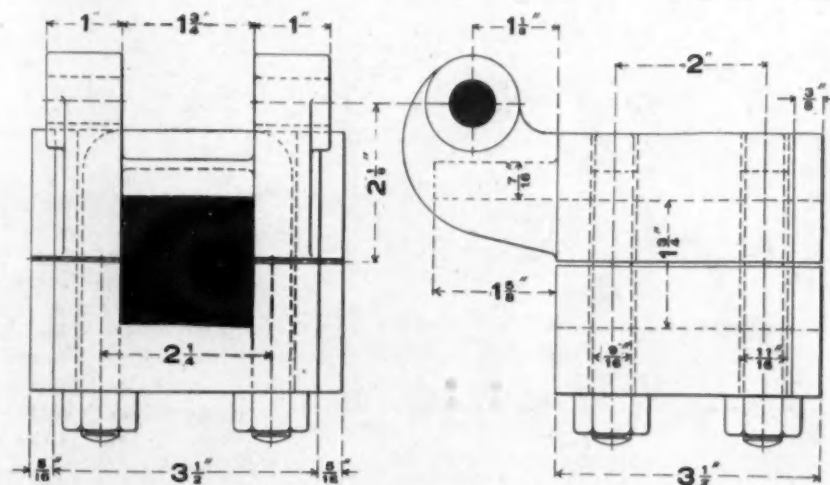


Figure 4.



The A. B. C. of the Gas and Gasoline Engine

CONTENTS OF PREVIOUS SECTIONS.

Section 1. Principle of gas and gasoline engines similar.—Introduction of two cycle engines.—First gas engines used.—Three types and their subdivision.—Requirements, gasoline or gas, mixture of air, and electric spark or hot tube.—Necessity and admission of air.—Principal parts.—Accessories.—Water jacket.—Two cycle engine—what it is.—Parts of two cycle engines and their operation.—Admission valve, inlet passage, igniter and exhaust port and their purposes.—Operation of two cycle motors.—How charge is taken.—Object and operation of baffle plate.

Section 2. Four-cycle engine.—Operation and principal parts.—Description of cylinder, valve chamber, ignition device, valves, piston, piston rings, wrist pin, connecting rod and valve stem.—Why valve chamber is used.—Purposes of the piston ring.—Auxiliary exhaust port.—Why water jacket is necessary.—Heat due to explosion.—Sight feed lubricator.—Position and functions of valve chamber.

Section 3. Uses of two-cycle motor and complete description of the operation of all its parts.—Starting the engine.—Methods and devices used in starting engines of all descriptions.

Section 4. A general description of two to one reduction gearing, with illustrations and explanations of four forms in common use.

Section 5. Various forms of valve-operating mechanisms.

68. Frequent reference has been made in the sections immediately preceding to governing devices used in connection with valve regulating mechanism. The ob-

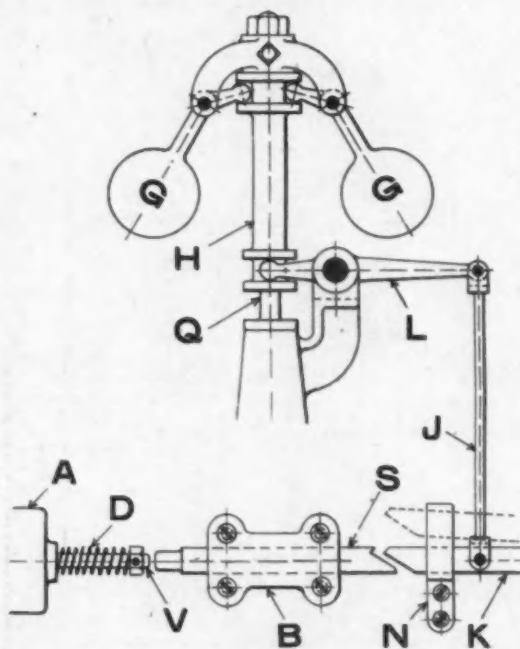


Fig. 23.

ject of the governor is to automatically regulate the speed of the engine. There are about eight ways by which this may be done, but those in most common use decrease the quantity of vapor admitted to the cylinder or permit the exhaust to open but slightly, thus preventing free exit of the burned gases and making it impossible to take in a full charge of vapor. In either case the result is a decrease in the engine's speed. As soon as the speed has decreased to the normal the governor again permits the valves to take in or emit the full charge.

69. All of the governors herein described are operated by the centrifugal force of the balls, lettered G in each case. So long as the engine runs at normal speed the balls are at rest. When it exceeds the normal the balls fly outward. They would continue to do so as the speed increased until they stood at right angles with

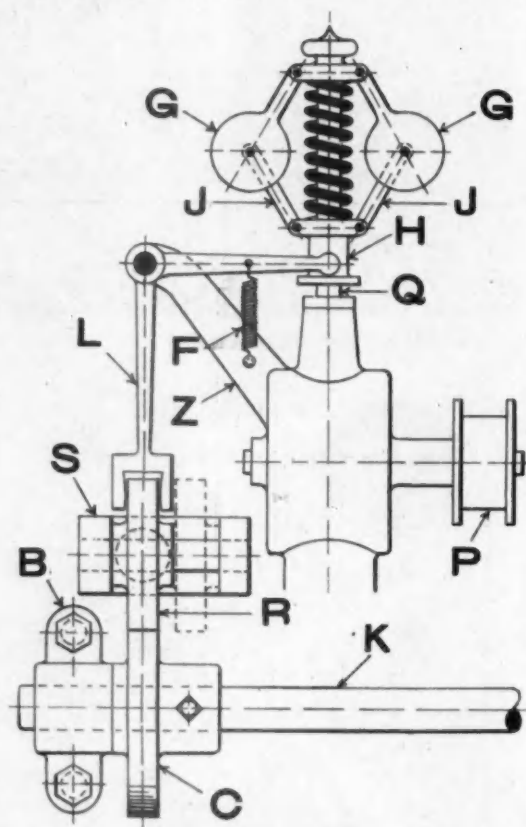


Fig. 24.

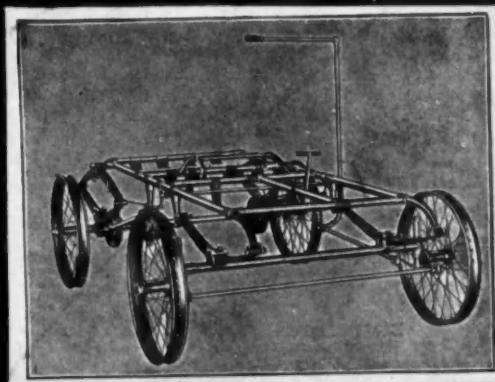
the shaft, were it not that their movement at once sets in operation the mechanism which decreases the speed.

70. Figure 23 illustrates one of the forms of centrifugal governing devices used in connection with the valve operating mechanisms shown in Figures 18, 21 and 22, to control the supply of mixture to the cylinder of the engine. When the spindle H of the governor is rotated by its actuating mechanism, which is, of course, driven from the engine, the centrifugal force causes the balls to rise and this action is transmitted

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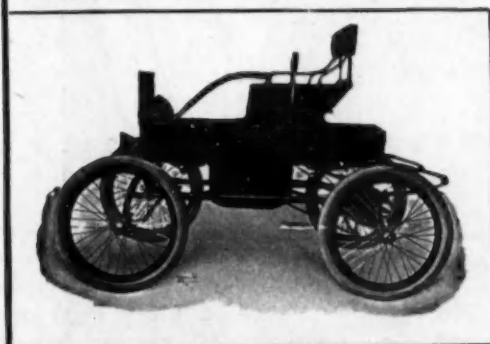
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by suitable rods and levers to the valve operating mechanism, and consequently controls the speed of the engine. In the drawing A shows the inlet valve with its spring D and stem V. S is the plunger rod with its guide block B. The cam rod K, which is actuated by the two-to-one gearing, with its guiding bracket N, is also shown. The cam rod K, previously described, has a pointed end, which engages with the notched end of the plunger rod S. It also may be made with a series of notches, as shown in Figure 18, to give a variable cut off, instead of the hit and miss type shown in Figure 23. H is a sleeve which slides upon the spindle Q. When the speed exceeds the normal the balls rise, the fingers at the other end force the sleeve H downward and the grooved collar at the lower end of H forces the forked extension of the lever L downward. Thus the long end of the lever L is raised and the pointed end of the cam rod K is lifted out of engagement with the notched end of the plunger rod S by means of the connecting rod J. In this position it fails to open the valve, thus preventing the piston from drawing a charge of mixture into the cylinder. The pointed end of the cam rod K is kept out of engagement with the notched end of the plunger rod S until the engine resumes its normal speed. This form of centrifugal governor depends solely upon the weight of the governor ball for its regulating action and is generally used on slow speed engines.

71. Figure 24 shows another form of centrifugal governor in which the speed of the engine is regulated by the cam roller upon the end of the rod (for description of cam rod and roller see Figs. 12, 13 and 15), being moved out of engagement with the cam. The type of governor here shown is spring controlled and is used principally upon high speed engines where more delicate regulation is required than with the form shown in Fig. 23. The governor is driven by means of a belt on the pulley P from another pulley located upon the main shaft of the engine. The bearing B supports the lay or two-to-one shaft K, on which is located the cam C. This shaft is driven by either bevel or spiral form of gearing, from the main shaft of the engine. Upon the governor balls G being raised through their centrifugal action, the sleeve H upon the stem Q is raised by means of the links J. This raises the sleeve

H, causing an inward movement of the lower arm of the bell crank lever L, which in turn forces the cam roller R inward to approximately the position indicated by the dotted lines, and therefore out of engagement with the cam C. The lever L is pivoted upon the arm Z. The spring F keeps the forked end of the lever L, in which is the cam roller R, in such position as to keep the cam roller in constant engagement with the cam, while the engine is running at its normal speed.

72. Still another form of centrifugal governor for controlling the valve operation is shown in Figure 25. Located upon the upper end of the governor stem Q is a slidable grooved collar H, which is partially surrounded by a yoke J, carried in a forked extension of the lever X, which is supported by the bracket Z. The cam roller R is carried in a jaw at one end of the cam rod

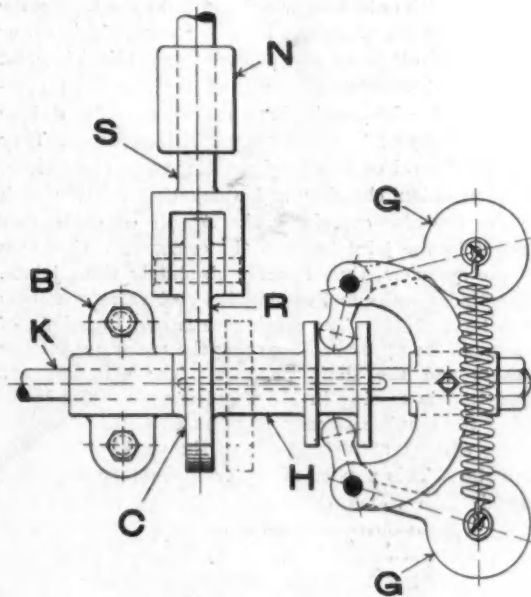


Fig. 26.

S, which slides in the bracket N. The cam C is located on the secondary shaft K, next to the bearing B. When the engine is at normal speed the square-jawed clutch is in engagement with the cam C. The speed of the engine is reduced by the disengagement of this clutch. When the governor balls rise through their centrifugal action the grooved collar H is raised and consequently depresses the long end of the lever X. This in turn causes an inward movement of the lower end of bell crank L, a similar movement of the upper end and an outward movement of the lower end of lever M, which acts upon the yoke J, forcing it outward and the clutch out of engagement with the cam C.

73. Figure 26 shows a form of centrifugal governor controlled valve mechanism in which the cam instead of the roller is moved out of engagement. The governor is located upon the secondary or two-to-one shaft, as shown. When the governor balls G are thrown out by their centrifugal force the fingers on the end of their arms, which engage in a grooved collar on the hub of the cam C, withdraw the cam C from engagement with the cam roller R. The governor balls are, on account of their horizontal position, held together by two tension springs, one on each side of the shaft K. The shaft K is carried in a bearing bracket B, and the cam rod S in a guide block N.

(To be Continued.)

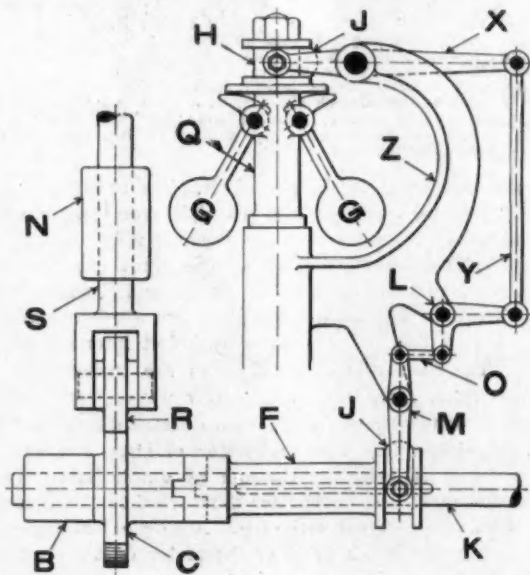
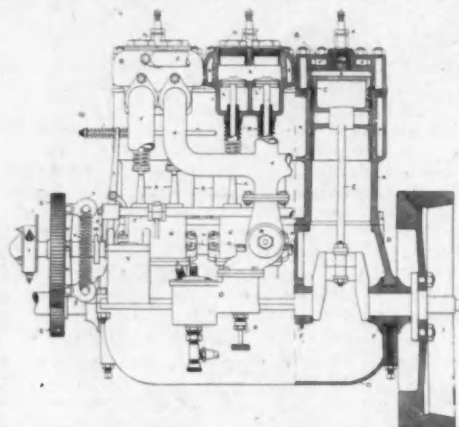


Fig. 25.

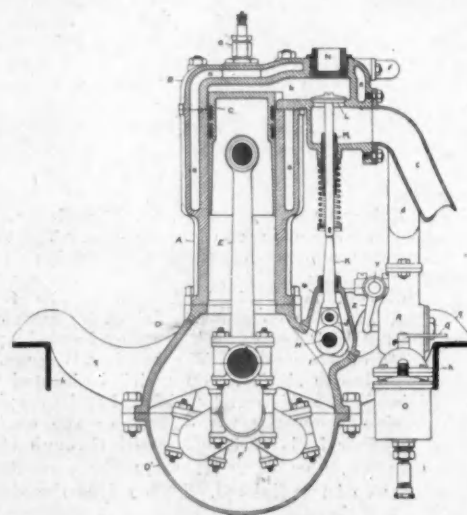


Side and end sectional elevations of the new 16 B. H. P. gasoline motor, with which the new touring car built by the International Motor Car Co. of Toledo, O., is fitted, are presented. The motor is of the three cylinder vertical type with outside flywheel, and is in the front of the vehicle under the aluminum hood or bonnet. This motor possesses a great many new points of mechanical interest and illustrates the development of the American automobile. It is of 16 brake horsepower, each of the three cylinders being of 4½-inch bore and 5½-inch stroke. They are cast integral or in a single casting of best gray iron. The combustion chamber and valve chamber for each cylinder are also cast integral. A soft copper gasket is fitted in the joint between the combustion chambers and the cylinders, thus forming absolutely tight joints. The cylinder walls and combustion and valve chambers are water jacketed. The crank case is cast in halves, of aluminum, the upper half carrying the motor supporting brackets and the shaft bearings. The cylinders are bolted to this casting in the usual manner. The lower half of the crank case may be removed should occasion require without disturbing any of the working parts of the motor. This portion of the crank case forms an oil reservoir into which the cranks dip and in this way



1st, cylinder in perspective; 2nd, cylinder valve chamber in section; 3rd, cylinder in section. A-A-A, cylinders; a-a-a, water jackets; B-B, valve chambers; b-b, compression spaces; C, piston; c, exhaust pipe; D, lower half crank case; d-d, inlet tubes; E, connecting rod; e-e-e, ignition plugs; F-F, crank boxes; f, water tube; G-G, cam shaft cases; g, supporting bracket; H-H, cam shaft; i, circuit breaker; K-K, valve lifters; L, inlet valve; L', exhaust valve; l, counteracting spring; M-M, valve guides; m, throttle governor connecting link; N-N, valve covers; O, carburetor; P, carburetor regulating screw; Q, mixture valve lever; R, throttle valve chamber; S, motor shaft pinion; S', cam shaft gear; T-T, governor; U-U, governor arms; V, governor spring; W, throttle cam; X, rock shaft arm; Y, rock shaft.

the crank bearings and connecting rod bearings are lubricated. The cranks are set at 120 degrees, and the shaft is forged of a single piece of "car axle steel." After turning it up it is hardened and ground on centers. The shaft is mounted in adjustable bronze bearings four in number. The cam shaft which operates not only the exhaust valves but the inlet valves as well, is driven from a bronze pinion on the engine shaft meshing with a



A, cylinder; B, cylinder head; C, piston; D, crank case (upper half); D', crank case (lower half); E, connecting rod; F, crank bearing; G, cam shaft case; H, cam shaft; I, cam; J, cam roller; K, exhaust valve lifter; L, exhaust valve; M, exhaust valve guide; N, valve cover; O, carburetor; Q, mixture valve lever; R, throttle valve chamber; Y, rock shaft; Z, rock shaft arm; a-a-a, water jacket; b, compression space; c, exhaust pipe; d, inlet tube; e, ignition plug; f, water tube; g-g, supporting brackets; h-h, sub. frame of vehicle.

bronze gear keyed to the cam shaft. The cam shaft is also lubricated on the splash principle from the crank chamber of the motor. The connecting rods are drop forged. The pistons, cast of a high grade gray iron, each have two ring grooves of double width and each groove carries two rings. The cylinders are bored and then lapped out, thus insuring a perfect internal surface. The inlet and exhaust valves are turned from forged nickel steel blanks. A screw plug covers each valve, by removing which the valves are readily accessible. A single float feed carburetor of large size supplies the three cylinders through an ample three-way induction pipe. The carburetor is attached to the motor and forms an integral part of it. A simple centrifugal governor controls the speed of the motor on the throttling principle. The action of this governor is sup-

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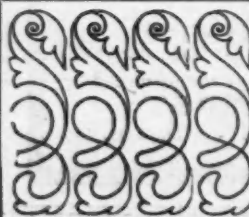
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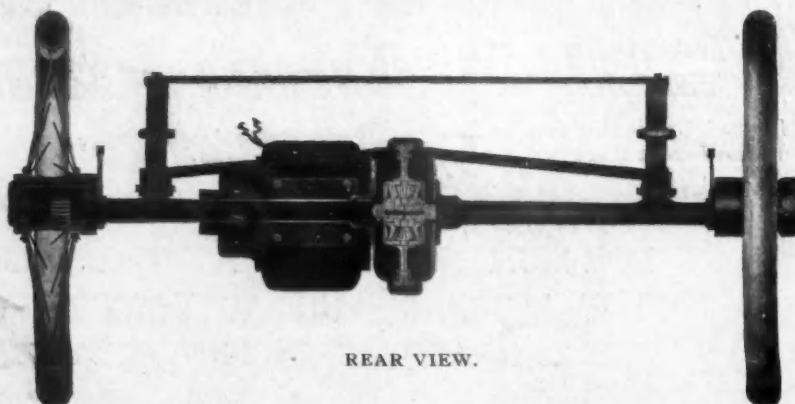
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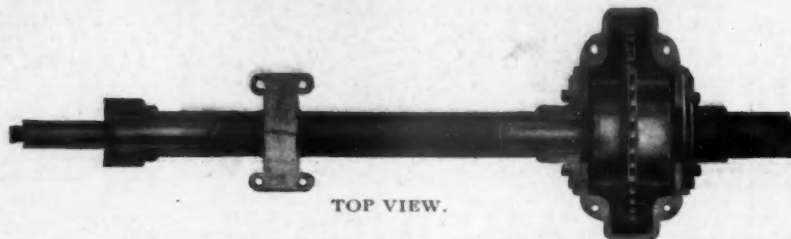


THINK OF THIS and let us show you what we have. You will find that we can show you the best goods on earth and make you money by saving it for you.



REAR VIEW.

THIS CUT represents the rear truck of the Electric running gear. This truck is self-sustaining and is independent of the front truck. YOU CAN MAKE ANY LENGTH WHEEL BASE DESIRED WITH A LINDSAY RUNNING GEAR. The driving shaft and compensating gear is protected and does not receive the end thrust that is produced by the wagon when turning corners, and running over rough roads. The top half of the gear case of this truck can be removed and the driving shafts pulled out through the hubs of the wheels, and then you can lift the compensating gear out of the case, while the wagon remains standing on its wheels in perfect order.



TOP VIEW.

THIS CUT represents another axle we make. NO MANUFACTURER CAN AFFORD to make a casing and driving mechanism for the price he can buy this at. Write us and let us figure with you; our goods will always be strictly first-class and up-to-date, and are well protected by U. S. patents.

Lindsay Automobile Parts Co.

Corner of South & Senate Aves. Indianapolis, Ind.

pressed by a small foot pedal or accelerator. When this pedal is depressed the speed of the motor is entirely controlled by a hand operated spark timing arrangement. Ignition plugs are located directly over the centers of the pistons. A very heavy fly wheel forms the fixed clutch member according to usual practice.

New Form of Crestmobile.

The Crest Mfg. Co., Cambridgeport, Mass., is introducing a new design of its well-known Crestmobile. The general arrangement of the machinery is simple, everything being visible. For this reason no disarrangement of mechanism is likely to take place and danger of accident is avoided. Every part can be examined in a standing position; there is no occasion to get under the carriage or remove any part of the body to get at the machinery. The motor and carburetor being on the front axle, they are kept free from dust and dirt, as all dirt thrown from the wheels passes to the rear. Other advantages of the Crestmobile are that the weight is more evenly distributed on the wheels, making equal wear of the tires and eliminating side slip and vibration. The transmission is under the body, being supported by the reaches, the shaft of the transmission running in flexible bearings. Chain drive is used. The motor is $3\frac{1}{2}$ horsepower, the total weight of carriage with all supplies being about 500 pounds. The Crestmobile is the lightest automobile now on the market and at the same time one of the strongest. The lightness is obtained by eliminating unnecessary machinery. All the gradations of speed, stopping of motor, cutting out the electric current, opening the exhaust valve is done by the movement of one handle, controlled by the right hand. The change from high to low or climbing speed is made by one movement of the clutch handle. Carburetor adjustment is made from small handle at top of steering column. The Crestmobile has a long wheel base, which means easy steering and comfort to the user. The tank, coil and battery are placed under the seat. The box in the curved dash is used for tools, rubber, etc. As no weight of machinery is supported by the body the springs are light and flexible, insuring easy riding. A double acting foot brake is used.

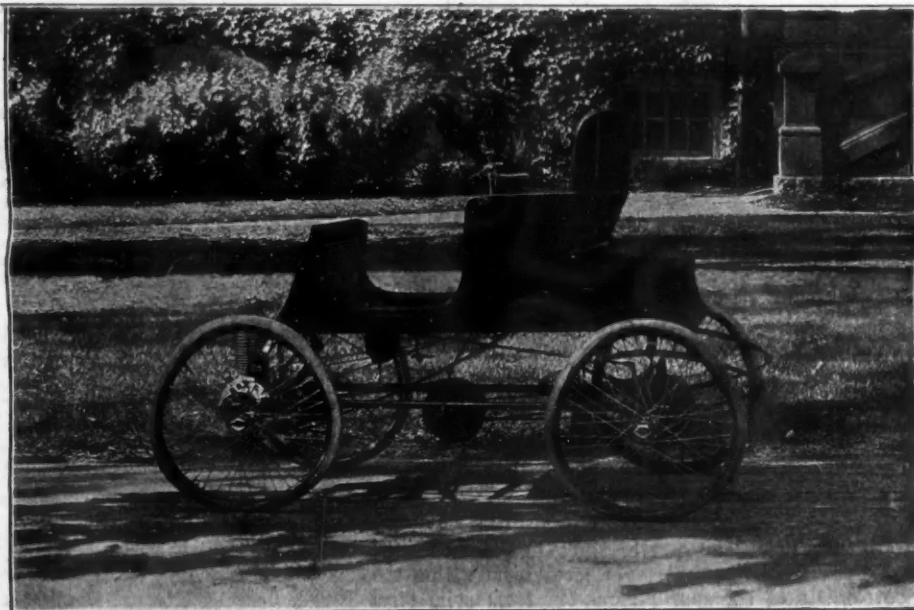
Another Builder in Michigan.

The Daisy Automobile Co., Flint, Mich., has been organized by Frank McPhillips and Mr. Harper, late of the Ash-Harper Co., Lansing, for the purpose of building machines of about 1,000 pounds weight. The company has behind it some of the best known men of Flint, all of whom have been actively connected with the manufacturing interests of the city for the last 20 years. Contracts have been let for all the material necessary

to complete the first twenty-five machines and as soon as the first lot are under headway material sufficient for 100 machines will be ordered. It is the intention of the company to build a standard machine in all respects and not to waste time or money in experimental work and to that end the officers have ordered all the material designed according to their own drawings. While the body design will be somewhat original in many respects, the remainder of the parts will be secured from makers of standard parts, all of which can be assembled without delay. It is the purpose of the company to have machines ready for the fall trade and to be at the shows with a complete line and a large supply ready for immediate delivery.

The Next Show at Paris.

The fifth annual exhibition given by the Automobile Club of France is announced to occur from December 10 to 25, 1902, at the Grand Palace, Champs Elysees, Paris. M. Rives, commissioner general, 6 Place de la



Concorde, Paris, will furnish details. The classes are as follows: 1. Automobiles, motor cycles and all mechanically propelled vehicles. 2. Bicycles. 3. Parts for the construction of automobiles and bicycles. 4. Automobile and bicycle tires. 5. Running gears and mechanisms of automobiles. 6. Accessories for automobiles and bicycles. 7. Motors and batteries. 8. Vehicles for business purposes. 9. Navigation, marine launches, Aerial navigation, flying machines. 11. Application of alcohol. 12. Sports and tours. 13. Automobile bodies. 14. Clothing and wearing apparel for automobilists, cyclists and tourists. 15. Inventions pertaining to automobiles, cycles and sports. 16. Books, photography, publications pertaining to automobiles, cycles and sports.

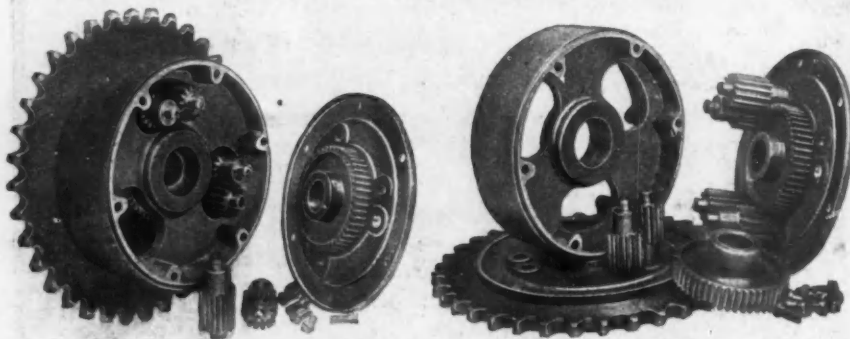
Sale of Gasmobile Property.

The complete plant and property of the Automobile Co. of America, is to be sold at auction on the premises, Marion, Jersey City, N. J., on Monday, Sept. 8, at 11 a. m. The ground covers an entire block of 3 acres, half covered with buildings. The main building is three stories in height, is of wooden construction, and has about 8,316 square feet of floor space. It contains a freight elevator. There are two engines in this building, one 250 and the other 75 horsepower.

The boiler is new, 250 horsepower. There is a full line of machinery and tools suitable for use in the construction of automobiles. A second building, of brick, was erected in 1901. It is two stories, was built with an elevator shaft, but has no elevator. There are about 2,664 square feet of floor space. There is a small oil house, 5x10 feet, built of concrete. There are several new finished automobiles, some second hand, and several in process of construction, beside much unmanufactured stock. There are one 12 horsepower surrey, one 12 horsepower special stanhope, and ten 9 horsepower stanhopes; four 4 cylinder touring cars, 20 horsepower, one 12 horsepower surrey, ten 9 horsepower stanhopes, beside one 6 cylinder 35 horsepower touring car, six 12 horsepower surreys and three 9 horsepower stanhopes unfinished. Three aluminum tonneau bodies, three surreys, nine tonneaus, twenty-four surreys and four stanhopes are included. The real property is subject to two mortgages, one for \$50,000, the other for \$15,000. The municipal taxes for 1900 and 1901 are unpaid, aggregating, with the interest, about \$3,000.

Dayton Differential Gear.

The Dayton Motor Vehicle Co. of Dayton, O., has just issued a leaflet describing and illustrating its new differential gear which is made in several sizes to suit trade demands. This gear consists of a central pulley with spoked hub, to which bolt two side plates which



support the pinion and gear bearings, and also keep the same in perfect alignment. The mechanism within the case consists of six spur pinions cut from solid steel and two spur gears. The gear is entirely enclosed and runs in a bath of oil. It can be adapted to use with a split axle, or one solid axle and sleeve.

Paint That Shows Absence of Oil.

To indicate when the moving parts of the machinery have become excessively heated a German inventor has devised a paint composed of an amalgam of the iodides of mercury and copper, which the inventor claims will change color when heated. Bearings to which it is applied are red under normal conditions, but when a temperature of over 140 degrees Fahr. has been reached the paint becomes black.

No Automobilist Need Apply.

Following is a copy of an ordinance which the village board of Lawrence has posted at each end of the Meadow Causeway:

"The use of the Meadow Causeway for motor vehicles is hereby prohibited under a penalty of not less than \$5 nor more than \$20 for each offense. In addition to this penalty it is ordained that any violation of this ordinance shall constitute disorderly conduct, and the corporation, association, person or persons vio-

lating the same shall be disorderly persons. This ordinance shall take effect immediately."

The Meadow Causeway is the broadest, smoothest and hardest thoroughfare on Long Island. Members of the Rockaway Hunt Club, most of whom drive automobiles, always used it as a short cut from Lawrence to the Rockaway Hunt Club grounds. By traveling over the causeway in their autos they saved a journey of 3½ miles and much unpleasant jolting over unspeakably bad roads.

Chicago Automobile Club Garage.

The building in the rear of the Chicago Automobile Club has been leased, and will in a few days be opened as a storage and repair station. The storage will be for members of the club only, but the repair department will be open to all. A machine shop with lathes, drill presses and necessary tools will be installed and operated by a gasoline engine. An air compressor with storage tank and air at 200 pounds pressure will be used for inflating tires, instead of the slow method of foot or hand pumps. An electrical charging outfit will also be installed. The station will be in charge of J. E. Crandall, who was formerly with the Woods Motor Vehicle Co. and recently resigned from the J. H. McCanna Co., manufacturer of power operated manifold lubricating devices, to take charge of the club station. Mr. Crandall is a first class mechanic, competent to fill

the requirements of the case, and will endeavor to cater successfully to the needs of invalid automobiles owned by members of the club and others.

A French paper recently published a letter in which it is claimed that a Swiss officer named de Planta was making experiments with a steam automobile on the roads in 1769 or one year before the Frenchman Cugnot built his steam vehicle.

Every night when he works, one of the inspectors for the Cleveland Electric Illuminating Co. travels 40 miles in his automobile examining the lights and wires of the company.

The Swiss military authorities have decided to spend about \$4,000 for the purchase of an automobile and accessories. It will be used especially for instructing drivers and manipulators and will be at the disposition of the artillery service.

The Clarkson & Capel Steam Car Syndicate, Ltd., has bought the English patents on the Bailey tire and has placed an order for molds and complete tires with C. J. Bailey & Co., of Boston.

The encouraging news comes from Milwaukee that at a final meeting of creditors of the Milwaukee Automobile Co. on Sept. 2, a dividend of 5 per cent will be declared.

Another remarkable run has been made with an electric vehicle. On the 21st Arthur C. Newby, of the National Vehicle Co., Indianapolis, driving a carriage of that company's make, visited a number of near-by towns until, having covered 80 miles without any appearance of exhaustion he determined to run the machine to a stand-still. The final score was 118 miles. The equipment of the machine was identical with that regularly supplied and the carriage underwent no special preparation for the trial.



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The Oldsmobile in the Front Ranks**

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PRICE \$650 00 F. O. B. DETROIT.

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Banker Bros. Co., East End, Pittsburgh, Pa.

Oldsmobile Co., 411 Euclid Ave., Cleveland, O.

W. E. Metzger, Detroit, Mich.

Ralph Temple & Austrian Co., 283 Wabash Ave., Chicago, Ill.

Fisher Automobile Co., Indianapolis, Ind.

Olds Gasoline Engine Works, Omaha, Neb.

W. C. Jaynes Automobile Co., 873 Main St., Buffalo, N. Y.

Day Automobile Co., St. Louis and Kansas City, Mo.

George Hannan, 1455 California St., Denver, Col.

Clark & Hawkins, Houston, Tex.

Hyslop Bros, Toronto, Canada.

Manufacturers' Co., 26 Fremont St., San Francisco, Cal.

A. F. Chase & Co., 215 Third St., Minneapolis, Minn.

Oldsmobile Co., 728 National Ave., Milwaukee, Wis.

Rochester Automobile Co., Rochester, N. Y.

F. E. Gilbert, Jacksonville, Fla.

Texas Imp. & Mach. Co., Dallas, Tex.

Abbott Cycle Co, New Orleans, La.

C. H. Johnson, Atlanta.

Sutcliffe & Co., Louisville, Ky.

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OLDS MOTOR WORKS,

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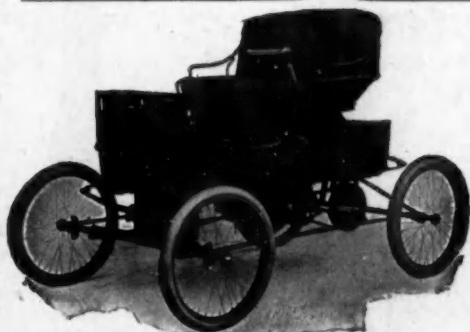
FACTS ARE BETTER THAN CLAIMS.

WALTHAM MFG. CO., Boston, Mass.

DEAR SIR: Enclosed please find check for balance due on Dr. Sylvester's Runabout. On Monday I ran my new ORIENT Runabout (the first day I had it) about twenty miles; the second day, twenty-five miles, and the third day seventy-five miles, without any adjustment whatever. The first day I took the Doctor up Mount Vernon Hill—off Charles Street—on the high speed without any start, and threw in my high speed after I was on the up grade. The third day I took Mr. ——— of the Shawmut National Bank, and we made the run from Boston to South Framingham, through the city, facing a very strong wind all the way, in one hour and ten minutes—about twenty-three miles—and returning from South Framingham to Park Square, Boston, in one hour and three minutes, slowing up for everybody that wore a white hat (for fear it might be a policeman). We made four miles in eight minutes and encountered two small hills; we took all hills on the high speed. I am very much pleased with my new ORIENT, and I can show speed of more than thirty miles an hour now with a new motor, and yet the Runabout glides along so easily you would scarcely think you were going over fifteen miles an hour. I have every reason to believe that it will be a big seller, and that our dealings will be mutually satisfactory and profitable to us both.

Yours truly,

A. J. COBURN & CO.



8 H. P., PRICE \$875.

On July 27, Mr. Callan, of Lynn, Mass., rode one of our Runabouts from Boston to New York inside of 23 hours, a distance of 260 miles, and, upon reaching New York, wired us: "*Arrived in New York at 1:40; machine ran like a watch.*" Facts like these speak louder than words.

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We know what it will stand, so guarantee a maximum figure on the repairs :: :: ::

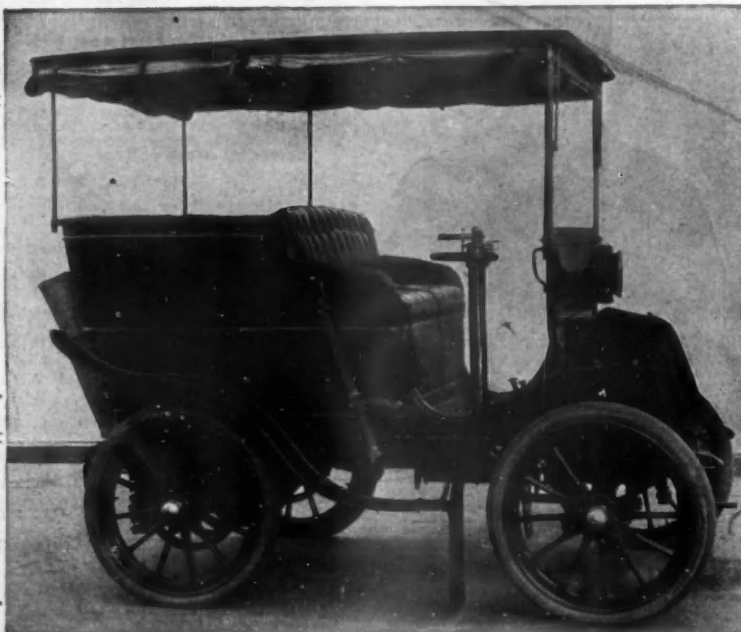
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FACTORY, NEWARK, N. J.



THE CYCLE AGE

Taylor's absence from the grand circuit last week robbed the championship contests of much of their interest and gave Kramer an increased lead. Taylor was not at Philadelphia on Wednesday, at As-

bury Park on Friday or at the running of the quarter-Kramer, of course, had things all his own way, adding five points twice and ten points once to his score. Kramer had thirty points when Taylor started on the circuit. He has actually won five out of eight races, in which Taylor has competed. The standing of the men up to the close of Saturday's meet at Vailsburg, on the basis of five points for first, three for second, two for third and one for fourth, with double points in national championship races, is:

	First.	Second.	Third.	Fourth.	Points.
Kramer	14	2	1	0	96
Taylor	3	4	0	1	36
Kimble	0	4	3	3	27
Collett	0	3	4	2	23
Lawson	0	5	1	2	19
Stevens	0	0	2	1	8
Finn	0	0	1	4	7
Fisher	0	0	2	1	7
Wilson	0	0	1	1	3
Bald	0	0	1	0	2
J. Bedell	0	0	0	1	2
Schreiber	0	0	0	1	1

The grand circuit this week is scheduled for New Haven on Tuesday, Providence on Wednesday, Hartford on Thursday and Manhattan Beach on Labor day.

Taylor Discusses His Chances.

Writing under date of August 1 to his friends in Paris, Messrs. Coquelle and Breyer, Major Taylor made the following reference to Kramer and others: "I consider Kramer a marvelous man, but without fear I shall line up against him tomorrow. If the race is run fast, and like last year, a man like McFarland sets the pace, Kramer has great chances to pass the post in front of me. If, on the contrary, the event is run slowly you can be convinced that I will pass him in the homestretch. Everybody is telling me that Kramer has never been faster than now. This is very possible, but I am faster than last year. Anyhow I will be the first to bow if he defeats me. It will probably not astonish you if I say that there is no more talk of Iver Lawson in the competition for the championships. Since my companion arrived in America he has run a dozen races, but he has only been able to win a consolation event. And you Frenchmen had the nerve to compare him with Zimmerman and a champion like Jacquelin. Lawson does not think about returning to Europe. He is satisfied to have visited Paris, and spent 2 weeks in Rome. He wants no more talk about his races at the Prince track. Another who does not want to return to you is

my pace-maker, Hazard. He was so terribly seasick that he said he would not cross the ocean except in company of Santos-Dumont—in a balloon."

Zim's Return to the Path.

Asbury Park, N. J., Aug. 22.—Arthur Augustus Zimmerman, champion of champions of days gone by, rode a mile behind a single motor cycle on the loose gravel of the local track in 1:49 and aroused the only enthusiasm of the day. Monmouth county fellow-citizens, circuit followers and race officials all joined in the greeting. "Zim" has been training for a reappearance in Paris at the Parc des Princes September 18 and looks and rides in fine form.



Kramer won the grand circuit third mile in 42 2-5s. with Lawson second, Stevens third and Fisher fourth. The 5-mile handicap fell to Menus Bedell (250), with Beauchamp (250) second, Martin (150) third, Eaton (250) fourth and Collett (50) fifth. Floyd Krebs won the two-thirds mile consolation, with Hadfield second and John Bedell third. Hadfield was disqualified, however, for causing a bad spill.

Vailsburg Has a "Tartar" Race.

Newark, N. J., Aug. 24.—Kramer and McFarland riding paired carried off the bulk of the money in the "Tartar" race at Vailsburg today. The race was at 5 miles with \$50 to the winner of each mile and \$5 to the leader at each intermediate lap. There were no prizes at the finish beyond the money for the fifth mile. The innovation was expected to produce great racing from start to finish. It did, but the champion sprinter and puller in combination did most of it. McFarland at the bell would pull Kramer into a good position for the sprint and then drop him. The combination could easily have been broken by a sprint following the mile, but no trio or quartette saw the chance. In the fourth mile, though, Armbruster, a despised outsider, made a rush and caught Kramer at the tape. There were thirty-one starters. The time was 10:45.

Tom Butler (25) won the half-mile handicap for non-winners at Vailsburg this year in 1:05 1-5, with Dan Sullivan (40) second, Orlando Stevens (25) third, and Rutz (30) fourth. Bowler helped Butler outrageously, but the referee did not see it.

Hurley won the open amateur half in 1:16 1-5, with Billington second, Schlee third and Glasson fourth. The 2-mile amateur handicap fell to Hooper (60), with Harry Nelsing (70) second, Zanes (60) third and Shirley (210) fourth.

Tom Linton's Magnificent Race.

Fifteen thousand people crowded the Princes track on the 15th, when the second heat of the three races which are called in Paris "the three days' meet," was

given. Before one lap was covered the world's records were almost equaled. Huret took the lead, but a few seconds later Linton passed ahead and the records began to fall. Linton, during this one contest broke the one-kilometer flying start record at least fifteen times. Nearing the twentieth kilometer Robl tried to pass, but was prevented and for nearly three laps it was a neck to neck race between the German and the Englishman, who finally passed the post a few yards ahead, having broken the 20-kilometer record by 22 1-5 s. Soon after Robl passed ahead, Linton, somewhat tired by his early effort, being left behind quite easily. But soon he again caught the German and for a while it was again a neck to neck contest. When he was going 47 1/2 miles Robl's tire punctured and in a second he lay on the cement, not giving a sign of life. Less than 50 yards behind Signonnaud, pacing Huret, was coming on as fast as a locomotive, but the boy had nerve and a good eye, and passed between the pole and Robl. The race became somewhat monotonous, inasmuch as Linton's tandem soon had trouble, but he was yet ahead of the records, and they fell even when he was riding without pace. It was hoped that the world's hour record would be broken, but under the circumstances it was not. However the 50-mile record was broken, Linton covering the distance in 1 h. 6 m. 45 1-5 s. Huret, who had quite a good advance, was so sure of second place that he slowed up toward the end, but Bouhours passed him on the last lap and won by nearly a quarter of a mile. At the end of the two days Linton was nearly 3 minutes ahead of Bouhours, second, and Huret, third.

Tied for the Championship.

New York, Aug. 24.—Chairman Batchelder has ruled that the tie between Marcus Hurley and E. F. Root at 18 points each, for the amateur championship must be run off at Hartford in September.

Kelly Company Gathering Patents.

The Kelly Handle Bar Co., of Cleveland, devotes as careful attention to every detail of its business today as it did during the boom days of the bicycle trade and with more satisfactory results since the business has settled down to a steady basis. For the last two years the company has been securing control of all patents covering practical divided handle bars and recently purchased all patents owned by W. D. Whitely and W. N. Whitely, Jr., of Springfield, Ohio, including George B. Durkee's patent of October 28, 1890. This covers the Sanger form of construction, where teeth are used on the ends of the bar arms to raise and lower the handles. Patent 704,159 covers divided bars with serrations or corrugations on the face of arms, same being held to the stem by a separate serrated or corrugated plate fastened by two bolts or cap screws. Patent No. 691,830 covers the forward extension style of bar and stem, using serrations or corrugation on stem and side arms. The company also controls several patents covering divided bars with a rocking motion and serrated arms.

This means that it has fully covered this class of bars and that the company will protect same by suit against makers or sellers of bars that infringe. The company expects to add a strictly high grade forward extension reversible bar. Business during the season has been better than expected.

Another Championship for Kramer.

Newark, N. J., Aug. 23.—In Major Taylor's absence Frank Kramer had trouble with Owen Kimble alone in winning the quarter mile national championship. The veteran Kentuckian seems to be improving with every meet and gave the champion a hard rub up the stretch. Kimble is one of the few not to lie down like a yellow dog when pitted against Kramer. The latter and McFarland teamed in the 5-mile handicap. This time, though, the Jerseyman did the pulling for 3 miles and then left the Californian to go it alone to victory. McFarland won in 10:34 2-5, with Fisher (100) second, Bowler (150) third, Menus Bedell (250) fourth.

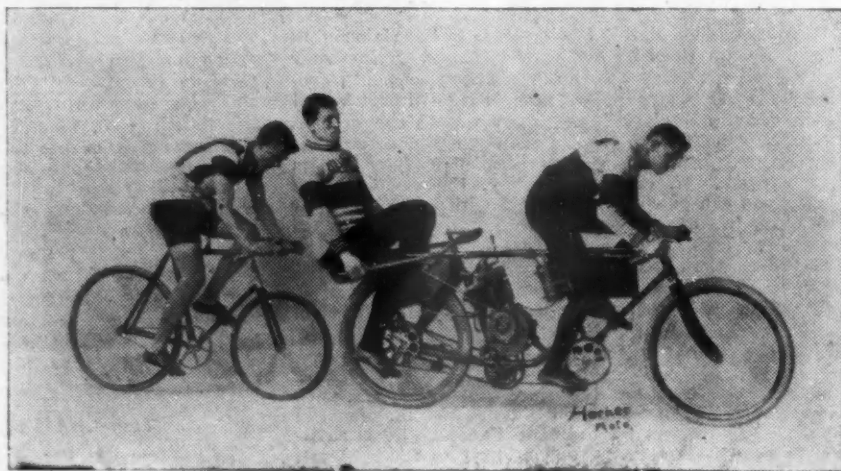
The metropolitan district mile championship went to Hurley in 2:51 2-5, with Harry Chappey second and George Glasson third. George Glasson (scratch) won the 2-mile amateur handicap in 4:24 3-5, with Forest (90) second, Schlee (30) third and Zanes (60) fourth.

Opening of Philadelphia Coliseum.

Philadelphia, Aug. 20.—The Kennedy-Prince coliseum was jammed tonight on the occasion of the grand circuit races. Kramer won the grand circuit half mile championship in 1:02 with Lawson second, Kimble third and Fenn fourth. Floyd Krebs took the 120-yard mark of Franz Krebs, who was absent, and ran away with the mile handicap in 1:52 3-5, with Jacobson (60) second, Hunter (120) third and Newkirk (100) fourth. The mile consolation resulted in the following order of finish: McFarland, Bowler, Schreiber, Martin. The time was 2:06.

Late European Racing.

At the races held in Copenhagen on the 10th, in which Jacquelin and Ellegaard took part, little Rutt won the scratch race from Eros and Huber. The French and Dutch champion did not dare to make an effort, owing to the wet track. In the tandem race the



Robert Walthour, the Crack Pace Follower of the Columbia Team.

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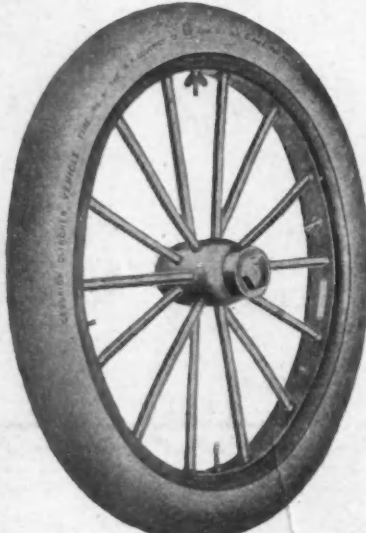
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Jacquelin brothers had a bad fall and the younger one broke his shoulder.

A road race between Paris and Rennes over a course of very near 200 miles was run on the 10th. Forty-five riders took part in the contest, which was won by Trosselier in 12 h. 43 m. Frederick was second, 12 minutes behind, and Aucouturier third. The three first named rode bicycles made by the American Cycle Mfg. Co.

The annual great prize of Antwerp was run on Aug. 10 and 12. Meyers, the Dutch champion won the purse in easy fashion from Dangla and Momo. He also won the half mile handicap.

Another grand prix was run on the 10th, this time in Hanover, Germany. After the usual heats Heering won from a large number of second, third and fourth class raters.

Cycling Brevities of all Sorts.

Followers of cycle racing have no idea of the expense of maintaining motor pacing machines for the middle distance riders. Apart from the gasoline and general repairs from time to time on the powerful tandems the question of tires is important. Not only is it a question of expense with the tires, but it is a question of safety. The terrific speed of these tandems on the board and on the cement tracks cause them to become heated to a degree that makes bursting a dangerous possibility. More riders have been hurt by exploding tires than any other accident in cycle racing. When a tire blows up the tandem comes almost to a stop and the rider following rarely escapes smashing into the rear wheel and suffering a severe fall. As to the cost of the tires, it has been figured that 50 cents a mile per machine is the real cost in a race. At Manhattan Beach track recently in traveling 25 miles two tires were worn beyond repair, each one of which cost \$5.50. When it is figured that these machines pace a rider in training 20 to 25 miles every day in addition to regular racing it gives an idea of the cost of maintaining these machines.

The pacing tandem supplied to Munroe of the Cleveland team by his manager, F. Ed. Spooner, is a novel machine. The motor is of the Soncin variety. It is the only one in this country of its kind in use on a pacing machine. The racket made by this 10 horse-power affair soon drowns the noise made by other motors. It is the most reliable of all the pacing machines as it has yet to "skip" or break a chain. It provides absolutely regular pace. Munroe's 25-mile race at Vailsburg, when he defeated Butler and McFarland, was timed by 5-mile stretches as follows: 7:03 2-5, 7:03 3-5, 7:03 3-5, 7:04 and 7:01 4-5.

It is questionable whether there was ever a more popular victory than the one scored by Frank Beauchamp in the handicap at Ottawa recently. It was announced that Beauchamp was from Australia, with more or less English blood in his veins, and the Canadian spectators naturally desired him to finish in the lead. Beauchamp seemed to be enthused with the feeling that permeated the onlookers, and from the first crack of the gun, until the tape was reached, he dug desperately at his pedals. It was his first victory in America.

"There are tricks in all trades but ours" may be quoted by the bicycle riders in paced competition, but the referees and those who govern the sport find it hard to promulgate rules to block the schemes that the men work up in order to secure a little advantage over their competitors. The very latest is the bending out of the pedal cranks on the pacing machines. This compels the pacemakers to pedal rather awkwardly, but it means an inch or two more of wind protection to the rider following.

Willie Fenn is now hailed as the handicap king, with no one to dispute the title. The member of the Cleveland team now holds all world's records in handicaps from 2 to 10 miles. In his phenomenal ride at Manhattan Beach last week, he started from scratch, with the next man 100 yards away, but ultimately reached the head of the bunch in time to apply his marvelous sprint, which carried him across the tape an easy winner.

The Philadelphia coliseum has been opened by J. C. Kennedy and Jack Prince, and from 5,000 to 6,000 spectators have attended every meeting and the racing men have supplied sport of the thrilling order. The manner in which they whirl around the steep six-lap board oval is a revelation to Philadelphians, who never before had the opportunity of witnessing the sport on one of the modern courses.

Jacobson, of New Haven, has been added to the team of the American Cycle Mfg. Co. He will ride as a member of the Cleveland team. The "Nutmegger" was laid up for almost 8 months by his fall of last year, but now seems to be reaching the form that he showed before the accident. Jacobson recently captured the circuit handicap at Baltimore and also the one at Atlantic City.

Three of the fastest riders of the big racing team of the American Cycle Mfg. Co. are disabled and have not appeared on the track for some time. They are John T. Fisher, of the Monarch team; Iver Lawson, the Cleveland rider, and Will C. Stinson, the Rambler rider. All three are expected to appear in competition within the next few days.

After having ridden 840 miles on a motor bicycle in 48h. 34m. 30s. in an attempt to beat the 1,000 mile record at Minneapolis, John Nilsson was forced, by rain, to stop, the path being unridable. He had beaten all records at that time being no less than 11½ hours ahead of Hansen's time at 800 miles.

W. F. King, of the Tribune team, and Jimmy Hunter, of the Cleveland team, are camping at the Atlantic City track, where they are ready to meet all comers in races behind the motors. Both men will probably ride in the 6-day team race to be held at Madison Square Garden in December.

The American Bicycle Co. has sold to the Stevens Arms & Tool Co. the plant formerly owned by the Lamb company at Chicopee Falls, at which Spalding bicycles were made after the Overman and Spalding companies quarreled. The consideration is reported to have been \$95,000.

The time made by George C. Schreiber in the 10-mile international championship race at Ottawa, On August 2, 22:30 2-5, is a world's record for the distance. Schreiber is a member of the Imperial team of the American Cycle Mfg. Co.

The Industrial Machine Co., which is to manufacture the De Long motor bicycle, will do business at Syracuse instead of Phoenix, N. Y., as heretofore. A factory has been secured and is being prepared for the production of machines.

Hall celebrated his return to the track after three weeks of rest by a victory. The English member of the Monarch racing team is scheduled for plenty of work during the remainder of the season.

For insolence and attempting to "bully" an official at a race meet at Vailsburg F. A. McFarland, the California rider, has been discharged from the racing team of the American Cycle Mfg. Co.

The Park City Mfg. Co., maker of the celebrated D. and J. hanger, writes that there is no truth in a story, recently circulated, that the company's factory will be removed to Webster City, Ia.

WITH CORRESPONDENTS.

Market for Old Rubber.

Rushville, Ind.—Editor MOTOR AGE: Can you tell me where there is a good market for old rubber, outer casings, inner tubes, etc?—J. H. L.

Mechanical Rubber Co., Morgan & Wright, both of Chicago; Boston Woven Hose & Rubber Co., Boston, or any large rubber house will purchase old stock in large quantities.

Increased Stroke and Power.

Chicago, Ill.—Editor MOTOR AGE: I have the castings for a double cylinder gasoline motor 3½ inches bore and 4½ inches stroke. How much will it increase the compression and the horsepower of the motor if I increase the stroke to 5 inches? There is plenty of room in the crank chamber for a larger throw crank.—Enquirer.

Unless the cubic contents of the combustion chamber are known it is impossible to calculate the increase in the compression by the increase of the stroke. If the estimated or rated horsepower of the motor under its original conditions is known, the increase can easily be calculated as it will be directly proportional to the increase in stroke.

Motor Which Couldn't Be Stopped.

Paterson, N. J.—Editor MOTOR AGE: I have been experiencing some trouble with my motor bicycle. I found that when the switch, which is located in the grip of the handle bar, is thrown out, or even when the grip is entirely removed from the handle bar, the motor continued to run. I then removed the plug, which is located on the top tube, and the motor still continued running. The only way I could stop it was

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to shut off the gasoline supply. Even then it ran for several minutes. Can you tell me what is the cause of this trouble and where to look so as to locate it?—P. D. S.

The trouble is most likely that the wire which runs from the insulated terminal of the contact maker on the motor to the grip switch, through the front post or head and handle bar, is grounded inside either the post or handle bar. This is generally caused by some of the strands of the flexible wire becoming loose where the end of the wire is attached to the insulated switch connection in the end of the handle bar, and consequently touching the metal of the tube. This can be readily ascertained by removing the switch piece and examining the condition of the end of the insulated wire connected with it.

Officers of Manufacturers' Association.

Algonac, Mich.—Editor MOTOR AGE: Will you kindly furnish me through your journal the name and address of the secretary of the National Association of Automobile Manufacturers, and oblige.—W. E. Bostwick, M. D.

F. J. Lande, secretary; Harry Unwin, assistant secretary, 7 East Forty-second street, New York.

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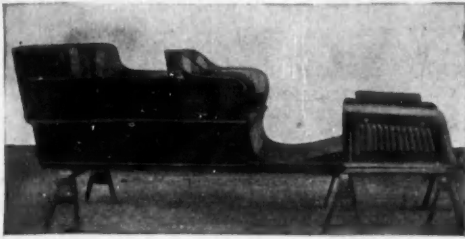
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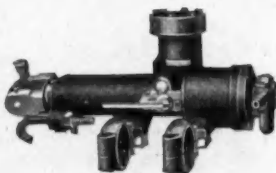
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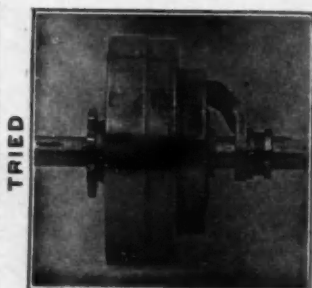
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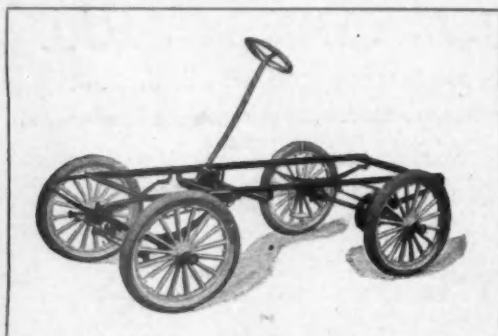
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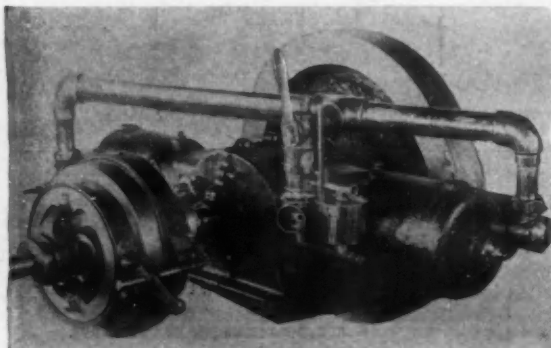
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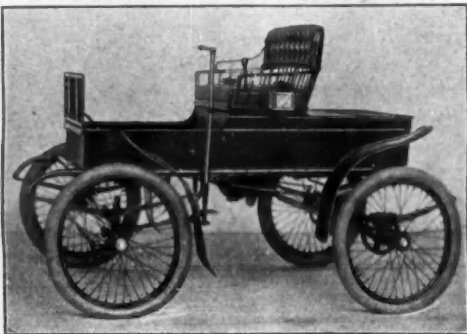
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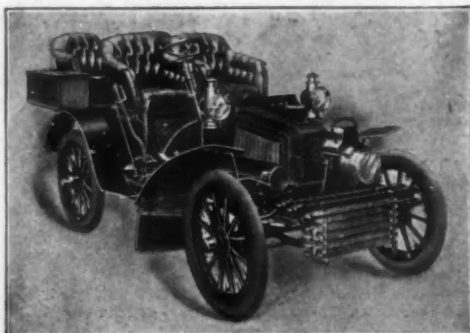
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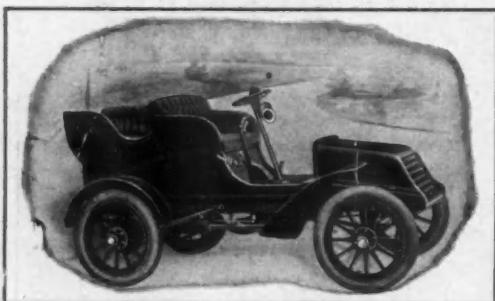
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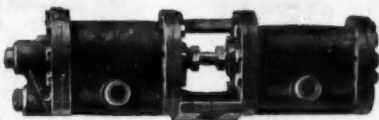
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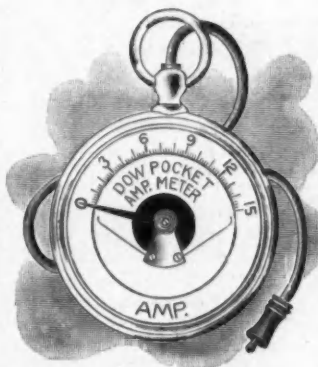
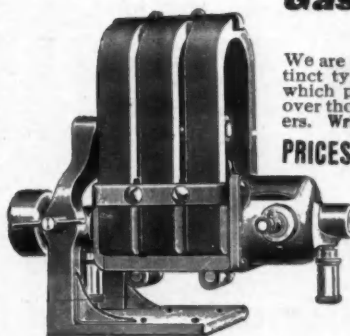
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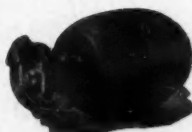
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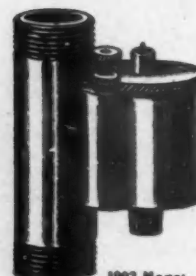
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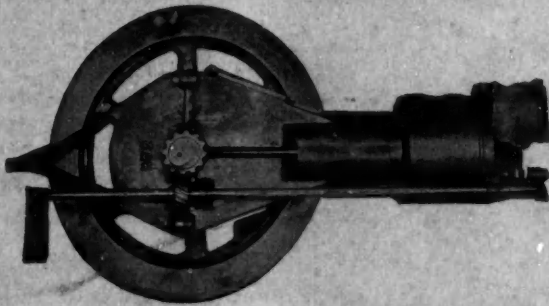
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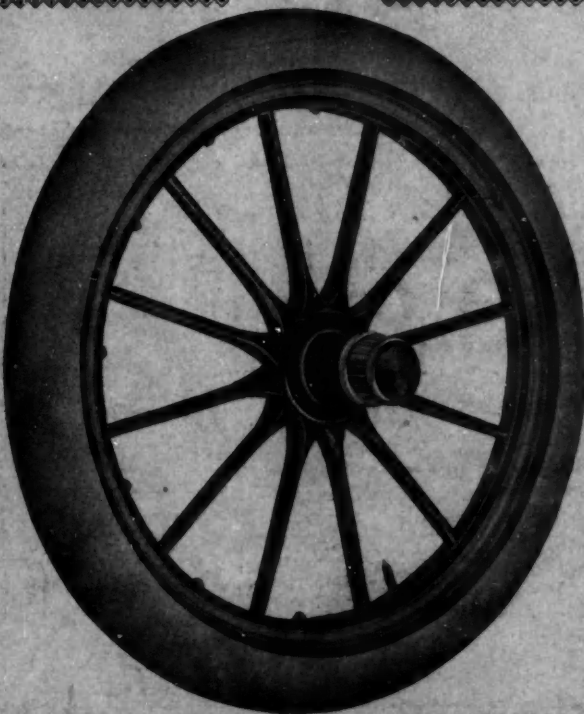
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